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RESEARCH ARTICLE

Revision of *Lineostethus* (Heteroptera: Pentatomidae: Discocephalini)

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ABSTRACT. *Lineostethus* Ruckes, 1966 has four species, *L. clypeatus* (Stål, 1862), *L. graziae* Hildebrand & Becker, 1982, *L. marginellus* (Stål, 1872), and *L. tenebricornis* (Ruckes, 1957); mostly restricted to Central America, but with distribution records in the southern North America. *Lineostethus* is one of the discocephaline genera with discoid head. The last review of the genus, from the 1980's, focused on the genital morphology and failed to provide updated descriptions or a key to species. We had access to material from different collections, including several specimens representing new species of *Lineostethus*, and males of *L. marginellus* which shows important variations in genital morphology. Here we update the generic description of *Lineostethus* and its known species and describe the new species *Lineostethus acuminatus* **sp. nov.** (holotype male in DZUP: Costa Rica, Guanacaste), *Lineostethus auritus* **sp. nov.** (holotype male in AMNH: Mexico, Oaxaca), *Lineostethus otarus* **sp. nov.** (holotype male in AMNH: Mexico, Michoacán) and *Lineostethus sinuosus* **sp. nov.** (holotype male in DZUP: Mexico, Yucatán). Additionally, we provide identification keys and distribution maps.

KEY WORDS. *Discocephala*, Discocephalinae, Neotropical, *Platycarenus*, taxonomy.

INTRODUCTION

Members of Discocephalinae are recognized primarily by the labium inserted usually on or posterior to an imaginary transverse line crossing the head on the anterior limit of eyes, and by the abdominal trichobothria usually placed lateral to the spiracles (Grazia et al. 2015, Rider et al. 2017). Two tribes restricted to the Americas, Discocephalini and Ochlerini, are classified in Discocephalinae (Rolston and McDonald 1979, Rolston 1981). A generic key is available for the genera of Ochlerini (Rolston 1992) and another for the genera of broadheaded discocephalines (Rolston 1990), and though both are outdated, *Lineostethus* Ruckes, 1966 can be identified using the latter.

Discocephalini comprises 44 genera and 193 species (Grazia et al. 2015, Rosso and Campos 2017) of light-brown to brown hues, often mottled with black or shiny black, distributed mostly in the Neotropical region.

Ruckes (1966) revised *Platycarenus* Fieber, 1861, raising the subgenus *Discocephalessa* Kirkaldy, 1909 to genus, and describing five new genera to include species removed from both *Discocephalessa* and *Discocephala* Laporte, 1832, along with new species. *Lineostethus* Ruckes, 1966 was proposed to include three species, *Platycarenus* (*Discocephalessa*) *tenebricornis* Ruckes, 1957, *Platycarenus* (*Discocephalessa*) *clypeatus* (Stål, 1862), its type species, and *Platycarenus* (*Discocephalessa*) *marginellus* (Stål, 1872). Ruckes (1966) considered *P.* (*D.*) *marginellus* a subspecies of *P.* (*D.*) *clypeatus* and provided a key to the species of *Lineostethus*. Along with a morphological study of the genitalia for the genus, Hildebrand and Becker (1982) considered *P.* (*D.*) *marginellus* a valid species, and described *Lineostethus graziae* Hildebrand & Becker, 1982. However, although the authors characterized the genitalia of both sexes for all species, the general body morphology was not described nor an updated key for the species was provided.

Looking through specimens of Discocephalini available from different collections, we found specimens matching the characteristics of *Lineostethus* that did not fit in any of the described species, as well as several males of *L. marginellus* showing important variations on the genital morphology. Here *Lineostethus* is revised with the redescription of the four known species, and the description of four new species from Central America. Identification keys for males and females are presented, and a distribution map is given.

MATERIAL AND METHODS

Specimens were observed and measured under stereomicroscope. The following morphometric parameters were taken: length and width of the head, pronotum and scutellum; length of the antennal and labial segments; total length, from the apex of clypeus to the apex of segment VII of connexivum; and maximum abdominal width. Measurements (mean ± standard deviation, minimum, and maximum) are given in millimeters. Internal genitalic structures were studied after boiling in 10% KOH aqueous solution and staining in Congo red. Specimens and genital structures were photographed using a stereomicroscope Nikon AZ100M and pictures stacked with Nikon NIS-Elements AR Microscope Imaging Software. Line drawings were made with a vectorial image processor on the pictures taken and checked under stereomicroscope. For the phallus, the dorsal and ventral views have no significant variations in morphology between the species and so, these views are illustrated only for the type species of *Lineostethus*.

The terminologies of Baker (1931), Dupuis (1970), Campos and Grazia (2006) and Garbelotto et al. (2013, 2016) were adopted for genital structures, and of Kment and Vilímová (2010) for cuticular structures of the external scent efferent system.

Site collection data were georeferenced using the Global Gazetteer Version 2.2 (Falling Rain Genomics Inc 2010) for those specimens without geographic coordinates informed in the respective labels, and the distribution map for the studied specimens was made with the software QGIS 2.10.1.

The specimens examined are deposited in the following collections: AMNH – American Museum of Natural History, New York, USA; CAS – California Academy of Sciences, San Francisco, USA; DARC – David A. Rider Collection, Fargo, USA; DZUP – Museu de Entomologia Pe. Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba, Brazil; EMEC – Essig Museum of Entomology, University of California Berkeley, Berkeley, USA; NHRS – Naturhistoriska riksmuseet, Stockholm, Sweden; UCRC – Entomology Research Museum, University of California Riverside, Riverside, USA; UFRG – Departamento de Zoologia da Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; USNM – National Museum of Natural History, Washington D.C., USA.

TAXONOMY

Lineostethus Ruckes, 1966

Lineostethus Ruckes, 1966: 22–26, figs 2, 9, 12, 17–18; Hildebrand and Becker (1982: 773–784); Rolston (1990: 30).

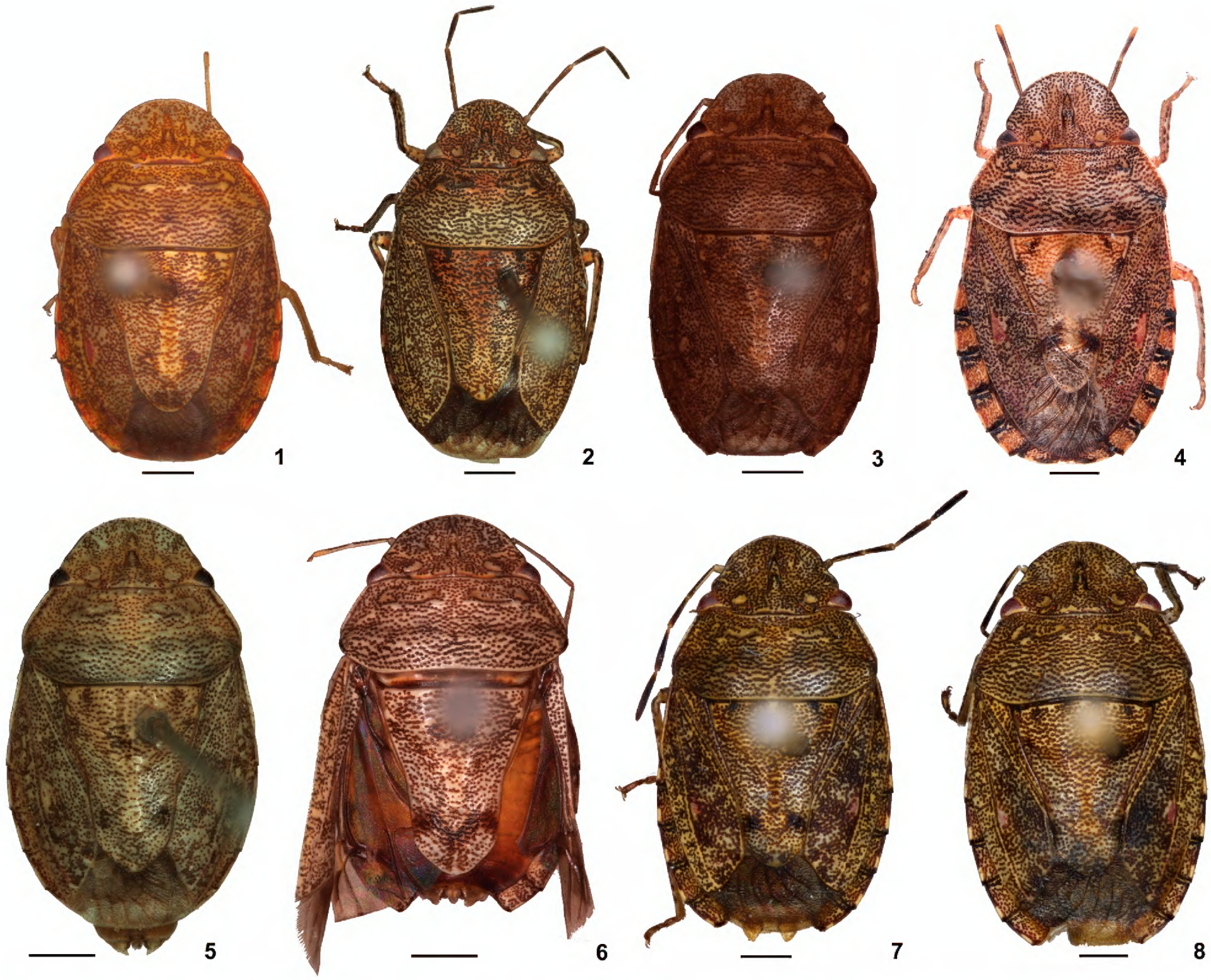
Type species. *Discocephala clypeata* Stål, 1862 – by original designation.

Redescription. Body oval, general color ivory with brown punctures. Head discoid, flat, wider than long. Mandibular plates longer than clypeus, overlapping at apex; lateral margins of mandibular plates outlined in brown close to the eyes. Ocelli minute. Area between eyes and ocelli with 1+1 elliptical spots without punctures (Figs 1–8). Antennae 5-segmented. Head ventrally tumescent between eyes and along bucculae. Bucculae weakly developed. Labium reaching the abdominal segment III.

Pronotum trapezoidal, wider than long; cicatrices flat and outlined by punctures. Anterolateral margins straight. Scutellum longer than wide, reaching connexival segment VI; apex usually uniformly convex to angulate. Corium longer than scutellum, reaching connexival segment VII; unpunctured area lateral to the apex of each radial vein subequal to or smaller than the width of one eye. Marginal area of anterolateral margins of pronotum and coria delimited by a line of punctures. Membrane fumose, reaching or surpassing the apex of abdomen, with 6 to 9 veins. Prosternum furrowed; mesosternum with 1+1 tumescent lateral areas, xyphus carinated; metasternum lozenge, carinated medially. Mesopleural evaporatorium sinuous, extending laterad beyond half of mesopleura; lateral margin of mesopleura without evaporatorium, except its posterior angle. Metapleural evaporatorium extending laterad beyond half of metapleura and with lateral margin sinuous; both meso- and metapleural evaporatorium concolorous with the body. Peritreme spout-shaped, scalpel-like. Legs with brown spots; tibiae with dorsal furrow.

Connexivum narrowly to widely exposed; tergite VIII of females usually visible from above. Abdomen furrowed ventrally at least on base and with punctures concentrated on lateral thirds; spiracles brown.

Male genitalia. Pygophore globose. Dorsal rim with 1+1 subtriangular to subrectangular foliaceous expansions projected on each side of segment X; cutting of dorsal rim U-shaped or subquadrangular around the segment X (Figs 9, 19, 27, 37, 45, 54, 62, 70: fdr, dr). Basal impression of the foliaceous expansions subrectilinear to sinuous (Figs 9, 19, 27, 37, 45, 54, 62, 70: bi). Posterolateral angles of pygophore reduced, obtuse or acute, usually not covered by the foliaceous expansions (Figs 9, 19–20, 27, 37, 45, 54, 62–63, 70: pa). Segment X elliptical, twice longer than wide and surpassing ventral rim margin. Margin of superior layer of ventral rim sinuous to concave, median excavation reduced and U-shaped to drop-shaped (Figs 10, 20, 28, 38, 46, 55, 63, 71: vr). Margin of the inferior layer of ventral rim with one or two lines of short bristles below the projections of the superior layer of ventral rim, bristles associated or not with punctures (Figs 10–11, 20–21, 28–29, 38–39, 46–47, 55–56, 63–64, 71–72: b). Superior layer of ventral rim projected ventrally, forming 1+1 projections varying in contour, length, width, and shape of apex, these projections forming an acute to obtuse angle with the posterolateral angles (Figs 10–11, 20–21, 28–31, 38–39, 46–47, 55–56, 63–64, 71–72: psl, pa). Parameres placed laterally to segment X, at least reaching the expansions of the dorsal rim; base of parameres circular and head subtriangular to sublozenge (Figs 12–13, 22–23, 32–33, 40–41, 48–49, 57–58, 65–66, 73–74). Phallotheca longer than wide, narrowing toward vesica; ventral surface of phallotheca subrectilinear to concave,



Figures 1–8. *Lineostethus*, dorsal aspect: (1) *L. clypeatus* (female); (2) *L. tenebricornis* (male paratype); (3) *L. marginellus* (male); (4) *L. graziae* (female holotype, photo by Mike Narahara – CAS); (5) *L. sinuosus* sp. nov. (male holotype); (6) *L. acuminatus* sp. nov. (male holotype); (7) *L. otarus* sp. nov. (male holotype); (8) *L. auritus* sp. nov. (male holotype). Scale bars: 1mm.

with a ventro-apical projection (Figs 14–16, 24, 34, 42, 50, 59, 67, 75: ph, ap). Vesica cap-shaped, apex concave to acute, apical margin following or not the ductus seminis distalis (Figs 14–16, 24, 34, 42, 50, 59, 67, 75: v, av, ds).

Female genitalia. Posterior margin of urosternite VII uniformly concave, or sinuous with median third subrectilinear (Figs 17, 25, 35, 43, 51–52, 60, 68, 76: VII). Gonocoxites VIII subrectangular to subtriangular; posterior margin subrectilinear to convex; sutural angles not juxtaposed (Figs 17, 25, 35, 43, 51–52, 60, 68, 76: gcVIII). Laterotergites VIII subtriangular; posterior margin subrectilinear to concave; spiracles visible (Figs 17, 25, 35, 43, 51–52, 60, 68, 76: la8, s). Gonocoxites IX subtrapezoidal. Laterotergites IX digitiform to subtriangular. Segment X rectangular, surpassing half of laterotergites IX; posterior margin concave to subrectilinear. Thickening of gonapophyses IX paired, varying in shape (Figs 18, 26, 36, 44, 53, 61, 69, 77: tgIX). Ring sclerites present and circular. Thickening of vaginal intima circular to subquadrangular (Figs 18, 26, 36, 44, 53, 61, 69, 77: vi). Ductus receptaculi with median duct of vesicular area enlarged distally; anterior annular crest parallel or turned to distal ductus receptaculi; pars intermedialis completely sclerotized or just on basal and apical thirds; posterior annular crest perpendicular to or directed toward capsula seminalis; capsula seminalis globose, without processes.

Distribution (Fig. 78). USA: *Arizona*, *Texas*. Mexico: *Nuevo León*, *Tamaulipas*, *San Luis Potosi*, *Veracruz*, *Jalisco*, *Hidalgo*,

Michoacán, *Morelos*, *Puebla*, *Oaxaca*, *Tabasco*, *Chiapas*, *Campeche*, *Yucatán*, *Quintana Roo*. Belize (**new record**). Guatemala: *Alta Verapaz*, *Baja Verapaz*, *Sacatepequez*. Honduras: *Cortes*, *Santa Barbara*, *Comayagua*, *El Paraiso*. Costa Rica: *Guanacaste*. Panama: *Los Santos*.

Remarks. *Lineostethus* was named by Ruckes (1966) after the thin carina both in xyphus and metasternum. The genus is possibly related to the other Discocephalini with a discoid head (e.g., *Acclivilamna* Ruckes, 1966, *Alveostethus* Ruckes, 1966, *Discocephala*, *Ischnopelta* Stål, 1868, *Platycarenus* and *Phoeacia* Stål, 1862) grouped by Rolston (1990) for identification purposes as the 'broadheaded' discocephalines. *Lineostethus* can be differentiated from the remainder of broadheaded genera by the body shape, especially the head uniformly convex, with an inconspicuous anteocular process, the pronotum subtrapezoidal, with anterolateral margins slightly convex, and the scutellum reaching the abdominal segment VI with lateral margins narrowing evenly toward the concave apex.

The genitalic morphology in *Lineostethus* is also diagnostic, both the female genital plates and the male pygophore. The female well exposed gonocoxites IX and segment X (Figs 17, 25, 35, 43, 51–52, 60, 68, 76), and the male foliaceous expansions of the dorsal rim and the ventral projections of the superior layer of ventral rim of pygophore (Figs 9–11, 19–21, 27–31, 37–39, 45–47, 54–56, 62–64, 70–72: fdr, psl) are features seen only in *Lineostethus* within the Discocephalini. The males of *Acclivilamna* also have paired expansions of the dorsal rim, but extremely sclerotized, not foliaceous, and short in length if compared to *Lineostethus*. Undeveloped posterolateral angles of pygophore are also seen in *Acclivilamna* and in some undescribed species of *Ischnopelta*; though in *Ischnopelta* the dorsal and ventral rims have neither projections nor expansions.

Lineostethus have a homogeneous general morphology making it difficult to identify the species based on characteristics other than genitalic. In addition, we examined a large number of specimens from different localities and were unable to confirm the characters of general morphology treated by Ruckes (1966) as diagnostic for some species (e.g., antennae uniformly tenebrous in *L. tenebricornis*, and the distribution of punctures on anterolateral pronotal margins and on basal costal margins in *L. clypeatus* and *L. marginellus*). The male genitalia are clearly diagnostic for the genus, and species can be promptly separated by the morphology of pygophore, especially the foliaceous expansions of dorsal rim (Figs 9, 19, 27, 37, 45, 54, 62, 70) and the projections of the superior layer of ventral rim (Figs 10–11, 20–21, 28–31, 38–39, 46–47, 55–56, 63–64, 71–72). However, differences between female genitalia are subtle making the determination of female specimens difficult. Exceptions are *L. sinuosus* Kochenborger & Garbelotto sp. nov., *L. auritus* Garbelotto & Kochenborger sp. nov. and *L. otarus* Garbelotto & Kochenborger sp. nov., which have sinuous posterior margin in gonocoxites VIII. Since non-genital characters are insufficient for distinguishing species of *Lineostethus*, the keys presented below, one for males and another one for females, use only genital characters.

Lineostethus is the Discocephalinae genus with the northernmost distribution and the only so far recorded in the Nearctic Region. Though this Nearctic occurrence was previously known (Ruckes 1957, Hildebrand and Becker 1982), the discocephalines have been regarded as occurring exclusively in the Neotropical region [restricted to the Neotropics sensu Grazia et al. (2015), endemic to the Neotropics sensu Rider et al. (2017)]. Following classic as well recent biogeographic regionalization systems (Morrone 2014, 2015) the Mexican Transition Zone and the Nearctic region should also be considered as part of the distribution of the subfamily.

Key for males of *Lineostethus* Ruckes, 1966

1 Foliaceous expansions of dorsal rim of pygophore longer than wide, surpassing the posterior limit of ventral rim by at least one third of the expansion length (Figs 62, 70: fdr)..... 2

1′ Foliaceous expansions of dorsal rim of pygophore subequal in length and width or wider than long, sometimes surpassing the posterior limit of ventral rim but for much less than one third of the expansion length (Figs 9, 19, 27, 37, 45, 54, 62, 70: fdr)..... 3

2(1) Basal impression of the foliaceous expansions subrectilinear; proximal portion of the lateral margin of foliaceous expansions sinuous; apex of foliaceous expansions rounded; posterolateral angles usually hidden dorsally by the foliaceous expansions (Figs 62–63: bi, dr, fdr, pa)..... ..... *L. otarus* Garbelotto & Kochenborger sp. nov. (Fig. 7)

2′ Basal impression of the foliaceous expansions sinuous; proximal portion of the lateral margin of foliaceous expansions straight; apex of foliaceous expansions truncate; posterolateral angles visible dorsally (Figs 70–71: bi, dr, fdr, pa)..... ..... *L. auritus* Garbelotto & Kochenborger sp. nov. (Fig. 8)

3(1′) Foliaceous expansions of dorsal rim of pygophore subequal to posterolateral angles in dorsal view (Figs 37, 54: fdr, pa) 4

3′ Foliaceous expansions of dorsal rim of pygophore either longer or shorter than posterolateral angles in dorsal view (Figs 9, 19, 27, 45: fdr, pa)..... 5

4(3) Basal impression of the foliaceous expansions clearly defined; cutting of dorsal rim subrectangular around the segment X; posterolateral angles of pygophore with acute apex (Fig. 37: bi, fdr); projections of the superior layer of ventral rim with rounded apex (Fig. 39: psl)..... .....*L. graziae* Hildebrand & Becker, 1982 (Fig. 4)

4′ Basal impression of the foliaceous expansions less defined; cutting of dorsal rim U-shaped around the segment X; posterolateral angles of pygophore with rounded apex (Fig. 54: bi, fdr); projections of the superior layer of ventral rim with hook-shaped apex (Fig. 56: psl)..... *L. acuminatus* Kochenborger & Garbelotto sp. nov. (Fig. 6)

5(3′) Foliaceous expansions of dorsal rim shorter than both the posterior limit of ventral rim and the posterolateral

angles (Fig. 9: fdr, pa); posterior limit of ventral rim subrectilinear (Fig. 10)..... *L. clypeatus* (Stål, 1862) (Fig. 1)

5' Foliaceous expansions of dorsal rim at least as long as both the posterior limit of ventral rim and the posterolateral angles, hiding or not the posterolateral angles in dorsal view (Figs 19, 27, 45: fdr, pa); posterior limit of ventral rim sinuous (Figs 20, 28, 46)..... 6

6(5') Foliaceous expansions of dorsal rim subquadrangular and expanded, hiding the posterolateral angles dorsally; cutting of dorsal rim subrectangular around the segment X (Fig. 19: fdr, pa, dr); margin of inferior layer of ventral rim with two lines of short bristles (Fig. 20: b)..... ..... *L. tenebricornis* (Ruckes, 1957) (Fig. 2)

6' Foliaceous expansions of dorsal rim subrectangular and not expanded, leaving the posterolateral angles visible dorsally; cutting of dorsal rim U-shaped around the segment X (Figs 27, 45: fdr, pa, dr); margin of inferior layer of ventral rim with one line of short bristles (Figs 28, 46: b)..... 7

7(6') Foliaceous expansions of dorsal rim longer than both the posterior limit of ventral rim and the posterolateral angles (Fig. 45: fdr); apex of the projections of the superior layer of ventral rim spatulate (Fig. 47: psl)..... ... *L. sinuosus* Kochenborger & Garbelotto sp. nov. (Fig. 5)

7' Foliaceous expansions of dorsal rim at maximum as long as both the posterior limit of ventral rim and the posterolateral angles (Fig. 27: fdr); apex of the projections of the superior layer of ventral rim acute (Fig. 28: psl) ....*L. marginellus* (Stål, 1872) (Fig. 3)

Key for females of *Lineostethus* Ruckes, 1966

1 Posterior margin of gonocoxites VIII sinuous (Figs 51–52, 68, 76: gcVIII)..... 2

1' Posterior margin of gonocoxites VIII convex or subrectilinear (Figs 17, 25, 35, 43, 60: gcVIII) 4

2(1) Gonocoxites VIII subtriangular; posterior margin of gonocoxites VIII strongly sinuous; sutural angles of gonocoxites VIII apart from each other and little projected over the laterotergites IX; lateral angles of gonocoxitesVIII little projected over the base of the laterotergites VIII (Figs 51–52: gcVIII, la8, la9, s)..... ... *L. sinuosus* Kochenborger & Garbelotto sp. nov. (Fig. 5)

2' Gonocoxites VIII subrectangular; posterior margin of gonocoxites VIII weakly sinuous; sutural angles of gonocoxites VIII juxtaposed; lateral angles of gonocoxites VIII uniformly convex or truncated (Figs 68, 76: gcVIII, la8, la9, s)..... 3

3(2') Posterior margin of urosternite VII uniformly concave; lateral angles of gonocoxites VIII uniformly convex (Fig. 76: VII, gcVIII)..... .....*L. auritus* Garbelotto & Kochenborger sp. nov. (Fig. 8)

3' Posterior margin of urosternite VII subrectilinear medially; lateral angles of gonocoxites VIII truncated (Fig. 68: VII, gcVIII)..... .....*L. otarus* Garbelotto & Kochenborger sp. nov. (Fig. 7)

4(1') Spiracles of laterotergites VIII anterior to an imaginary transversal line through the posterior margin of gonocoxites VIII and placed close to the lateral angle of gonocoxites VIII (Figs 43, 60: s, la8, gcVIII) 5

4' Spiracles of laterotergites VIII on or posterior to an imaginary transversal line through the posterior margin of gonocoxites VIII, and placed posterior to the lateral angle of gonocoxites VIII (Figs 17, 35: s, la8, gcVIII); if the spiracles are slightly anterior to the imaginary line, then each spiracle is placed away from the lateral angle of gonocoxites VIII (Fig. 25: s, la8, gcVIII)..... 6

5(4) Posterior margin of urosternite VII uniformly concave; gonocoxites VIII subquadrangular (Fig. 43: VII, gcVIII).... .....*L. graziae* Hildebrand & Becker, 1982 (Fig. 4)

5' Posterior margin of urosternite VII subrectilinear over gonocoxites VIII; gonocoxites VIII subtriangular (Fig. 60: VII)..... *L. acuminatus* Kochenborger & Garbelotto sp. nov. (Fig. 6)

6(4') Posterior margin of urosternite VII uniformly concave (Fig. 17: VII)..... *L. clypeatus* (Stål, 1862) (Fig. 1)

6' Posterior margin of urosternite VII subrectilinear medially (Figs 25, 35: VII) 7

7(6') Posterior margin of urosternite VII sinuous; gonocoxites VIII subrectangular (Fig. 25: VII, gcVIII)..... .....*L. tenebricornis* (Ruckes, 1957) (Fig. 2)

7' Posterior margin of urosternite VII concave; gonocoxites VIII subtriangular (Fig. 35: VII, gcVIII) ....*L. marginellus* (Stål, 1872) (Fig. 3)

Lineostethus clypeatus (Stål, 1862)

Figs 1, 9–18, 78

Discocephala clypeata Stål, 1862: 96; Stål (1868: 18); Stål (1872: 6); Distant (1880: 45, plate 6, fig. 1); Uhler (1886: 5); Lethierry and Severin (1893: 83); Banks (1910: 92).

Discocephala inobtrusa: Walker, 1867: 183 (synonymy by Kirkaldy, 1909).

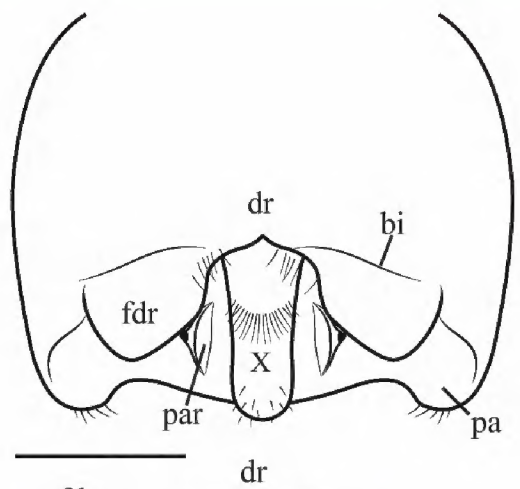
Platycarenus (*Discocephalessa*) *clypeatus*: Kirkaldy (1909: 215).

Lineostethus clypeatus clypeatus: Ruckes (1966: 24–26, figs 2, 5, 17, 18).

Lineostethus clypeatus: Hildebrand and Becker (1982: 778–780).

Diagnosis. Males of *L. clypeatus* differ from the other species by the shorter and more rounded foliaceous expansions of the dorsal rim of pygophore, and by the projections of the superior layer of ventral rim short and tapering to its apex (Figs 9–11: fdr, psl). The female genital plates are very similar to *L. marginellus* but can be differentiated by the slightly shorter gonocoxites VIII. The helicoidal distal portion of ductus receptaculi, the fusiform thickening of gonapophysis IX, and the elliptical thickening of vaginal intima also help to differentiate *L. clypeatus* from the other species.

Redescription. Antennal segments I–III with longitudinal brown lines. Anterolateral margins of pronotum and proximal portion of lateral margin of corium punctured in some specimens. Scutellum sometimes with a spot of brown punctures on disc and on post-frenal lobe. Unpunctured area laterad to the apex of radial vein of coria subequal to the width of one eye.



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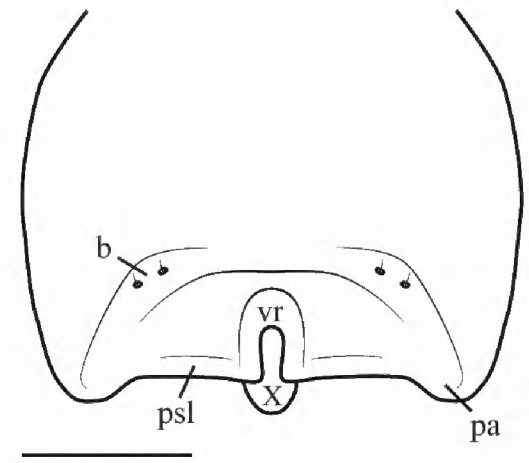

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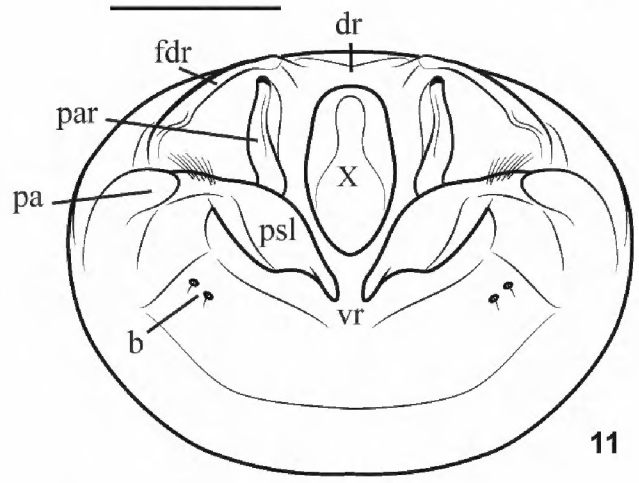

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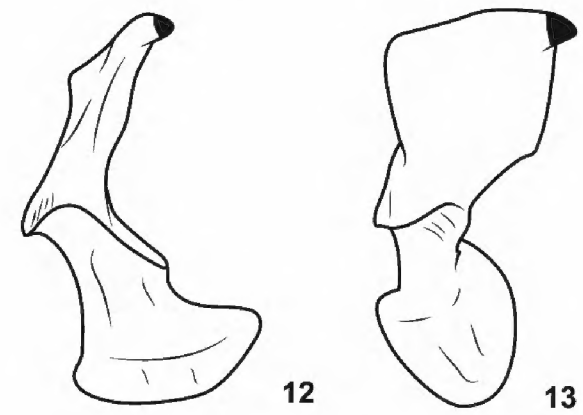
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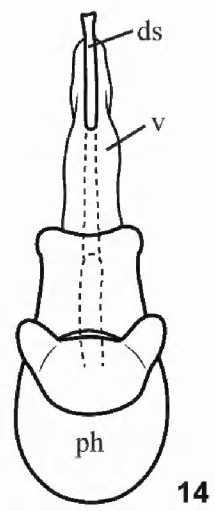

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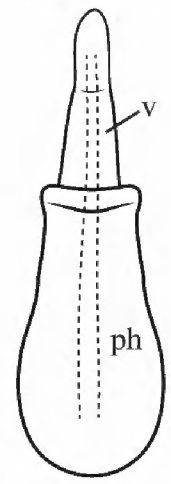

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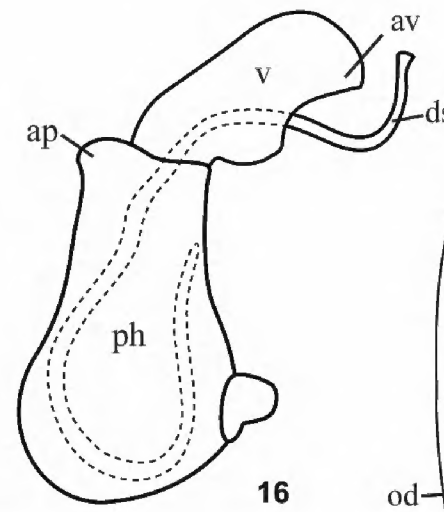

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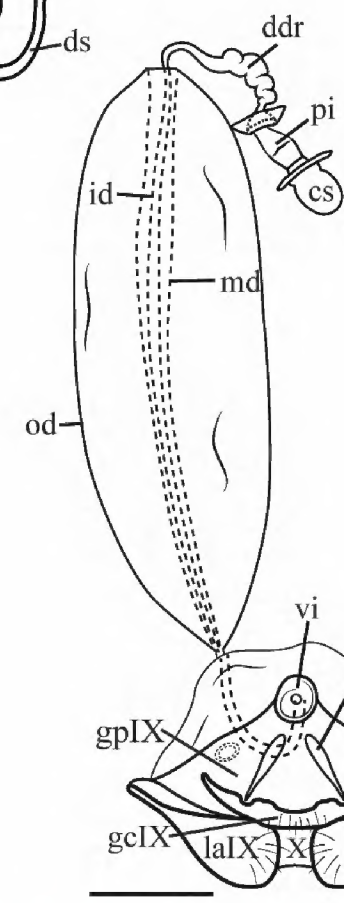

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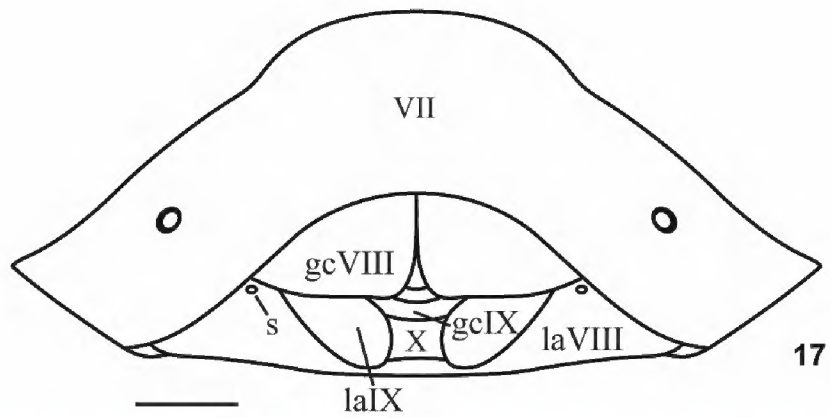

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Figures 9–18. *Lineostethus clypeatus*: (9–11) male pygophore, dorsal, ventral and posterior views respectively; (12–13) left paramere, dorsal and lateral views; (14–16) phallus, dorsal, ventral and lateral view; (17) female genital plates; (18), female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 9–13, 17 = 1 mm; 14–16, 18 = 0.5 mm.

Hemelytral membrane slightly surpassing the apex of abdomen, with 6–7 veins. Ventrally, punctures sparse and concentrated laterally. Femora with sparse brown circular spots on apical half.

Male genitalia. Foliaceous expansions of dorsal rim subrectangular; apex of expansions not surpassing the posterior limit of ventral rim; posterolateral angles visible dorsally. Basal impression of the foliaceous expansions concave, cutting of dorsal rim U-shaped (Fig. 9: bi, fdr, dr). Posterolateral angles with rounded apex (Figs 9–11: pa). Margin of the superior layer of ventral rim flatly concave, median excavation drop-shaped (Fig. 10: vr). Margin of the inferior layer of ventral rim with one arc of short bristles (Figs 10, 11: b). Projections of the superior layer of ventral rim forming an obtuse angle with the posterolateral angles; projections tapering toward apex and covered by setae (Fig. 11: psl, pa). Apex of parameres diverging, not reaching the foliaceous expansions of dorsal rim; head lozenge (Figs 9, 11–13: par). Ventral surface of phallotheca subrectilinear (Figs 14–16: ph, ap). Vesica with rounded apex; apical margin concave extending to mid of ductus seminis distalis (Figs 14–16: v, av, ds). Distal portion of ductus seminis distalis subequal to vesica in length, tapering towards apex (Fig. 16: ds).

Female genitalia. Posterior margin of urosternite VII concave (Fig. 17: VII). Gonocoxites VIII subtriangular; posterior margin slightly convex, sutural margins juxtaposed at basal-two thirds; sutural angles in open "V" (Fig. 17: gcVIII). Posterior margin of laterotergites VIII slightly convex; limit between laterotergites VIII and tergite VIII sometimes not visible (Fig. 17: la8). Posterior margin of gonocoxites IX subrectilinear (Fig. 17: gcIX). Laterotergites IX digitiform, lateral margins convex and mesial margins rectilinear to slightly convex, subparallel or divergent (Fig. 17: la9). Posterior margin of segment X subrectilinear (Fig. 17: X). Thickening of gonapophyses IX fusiform, surpassing the lateral margin of the thickening of vaginal intima (Fig. 18: gpIX, tgIX). Thickening of vaginal intima elliptical and flat (Fig. 18: vi). Distal portion of ductus receptaculi helicoid apically (Fig. 18: ddr); anterior annular crest turned to distal ductus receptaculi; pars intermedialis subequal in length to capsula seminalis; middle third of pars intermedialis not sclerotized; posterior annular crest perpendicular to pars intermedialis (Fig. 18: pi). Capsula seminalis with a slight basal constriction (Fig. 18: cs).

Measurements. Male (n = 5): head length, 1.55 ± 0.08 (1.45–1.63); width, 3.20 ± 0.18 (2.98–3.36); length of antennal segments: I, 0.44 ± 0.04 (0.38–0.48); II, 0.83 ± 0.06 (0.80–0.90); III, 0.78 ± 0.05 (0.72–0.82); IV, 0.91 ± 0.01 (0.90–0.92); V, 1.06 ± 0.03 (1.04–1.08); length of labial segments: I, 0.72 ± 0.06 (0.64–0.80); II, 1.55 ± 0.21 (1.22–1.80); III, 0.65 ± 0.13 (0.62–0.82); IV, 0.47 ± 0.05 (0.40–0.50); pronotum length, 1.78 ± 0.09 (1.70–1.92); width, 4.32 ± 0.18 (4.10–4.50); scutellum length, 3.56 ± 0.19 (3.40–3.84); width, 2.84 ± 0.19 (2.64–3.00); total length, 7.25 ± 1.02 (6.75–8.50); abdominal width, 4.76 ± 0.22 (4.50–5.00).

Female (n = 5): head length, 1.55 ± 0.04 (1.5–1.63); width, 3.05 ± 0.11 (2.98–3.24); length of antennal segments: I, 0.41 ± 0.01 (0.40–0.42); II, 0.72 ± 0.06 (0.64–0.78); III, 0.71 ± 0.09 (0.60–0.80); IV, 0.87 ± 0.10 (0.78–1.00); V, 1.01 ± 0.01 (1.00–1.02); length of labial segments: I, 0.65 ± 0.05 (0.62–0.70); II, 1.38 ± 0.20 (1.10–1.58); III, 0.64 ± 0.06 (0.58–0.70); IV, 0.50 ± 0.03 (0.46–0.52); pronotum length, 1.86 ± 0.07 (1.76–1.92); width, 4.08 ± 0.23 (3.80–4.40); scutellum length, 3.45 ± 0.11 (3.32–3.56); width, 2.68 ± 0.11 (2.54–2.85); total length, 7.05 ± 0.54 (6.67–8.00); abdominal width, 4.49 ± 0.18 (4.35–4.80).

Material examined. Holotype (female): MEXICO, Sallé, Type, Typus, 80 81, NHRS-GULI 000011382 (NHRS – photographs examined). Other specimens: USA, *Texas*: Cameron (Co. Sabal Palm Grove Sanct.), 1 female, 3-VI-1984, Marlin Rice leg. (DARC); Progreso (L. Fife 2260, On cotton, Lot No 44-14405), 1 female, 7-VI-1944 (USNM); Brownsville, 1 female, 03-V — Brooklyn Museum Coll 1929 Catal No. 28 (USNM); Brownsville, 1 female, VI-1901, H.G. Barber Coll leg. (USNM); Browsville, 1 female, 5-VI-1932, J.O. Martin leg. (CAS). MEXICO, *Nuevo León*: (15 mi W. Linares), 1 female, 2-3-VII-1973, Mastro & Schaffner leg. (DARC); *Tamaulipas*: (Nac. del Rio Frio 7 km SSE Gomes Farías), 3 females, 15-16-VI-1983, T. Riley leg. (DARC); Bocatoma (7 km SSE Gomes Farías), 1 female, 5-7-I-1981, E.G. Riley leg. (DARC); (5 mi. SSE of Gomes Farías), 1 female, 19-20-VII-1970, Murray Phelps Hart Schaffener leg. (DARC); *San Luis Potosi*: Rio Verde (Media Luna, 1000), 1 female, 20-VI-1982, M.A. Ivie leg. (DARC); (Hwy 85, SW Tamazunchale, 600), 1 female, 24-VII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); (10 mi N Tamazunchale), 1 female, 24-XII-1940, G.E. Bohart Collector leg. (CAS); (10 mi N Tamazunchale), 1 female, 24-XII-1940, G.E. Bohart Collector leg. (AMNH); (7 mi N Tamazunchale), 1 female, 19-IX-1972, W.Hanson J.Poff leg. (DARC); *Veracruz*: Acayucan, 1 female, VII-1966, J. & W. Ivie leg. (AMNH); (Hwy. 140, 4mi. NW Rinconada, 800), 1 female, 21-VIII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); *Jalisco*: (Hwy. 80, 17 mi SW Autlan, 1800), 1 male, 11-VIII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); (6 mi. NE Barra de Navidad, 500), 1 female, 11-VIII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); *Guerrero*: Acapulco, 2 males, 6-7-X-1961, Pereirra S. Halffter leg. (UFRG); *Campeche*: (22 mi NE Campeche), 1 female, 5-VIII-1974, C.W. & L. O'Brien & Marshall leg. (AMNH); *Oaxaca*: (Hwy.147, 54 mi SW Tuxtepec, 800), 1 female, 27-V-1983, C.W. & L.O'Brien & G.B.Marshall leg. (DARC); (5 mi N Palomares) 1 female, 31-VIII-1964, J. & W. Ivie Collectors leg. (AMNH); La Ventosa (26 mi N) 2 males, 19-VII-1963, J. Doyen Collector leg. (UFRG); La Ventosa (26 mi N), 3 females, 19-VII-1963, J. Doyen Collector leg. (UFRG); La Ventosa (26 mi N), 1 female, 19-VII-1963, Coll.: W.A. Foster leg.; (23 mi E. Zanatepec, 1600), 1 male, 3-VI-1974, C.W. & L. O' Brien & Marshall leg. (AMNH). HONDURAS, *Comayagua*: (5 mi NW Comayagua, 1600), 2 females, 18-19-VII-1974, C.W. & L.O'Brien & Marshall leg. (DARC). COSTA RICA, *Guanacaste*: (13 mi SE Libería, 400), 1 female, 12-VII-1974, C.W. & L.O'Brien & Marshall leg. (DARC); Santa Rosa National Park, 1 female, 16-18-VII-1980, D.H.J. Janzen & W. Hallwachs leg. (DARC).

Distribution (Fig. 78). USA: *Texas* (**new record**). Mexico: *Nuevo León* (**new record**), *Tamaulipas* (**new record**), *San Luis*

Potosi (Ruckes 1966), *Veracruz* (**new record**), *Jalisco* (**new record**), *Oaxaca* (Ruckes 1966, Hildebrand and Becker 1982), *Campeche* (**new record**), *Yucatán* (Ruckes 1966). Guatemala: *Alta Verapaz*, *Baja Verapaz* (Ruckes 1966). Honduras – *Santa Barbara* (Ruckes 1966), *Comayagua* (**new record**). Costa Rica: *Guanacaste* (Ruckes 1966). Panama (Ruckes 1966).

Remarks. From the data retrieved of specimens' labels, cotton (*Gossypium hirsutum* L., Malvaceae) is a possible host plant.

Lineostethus tenebricornis (Ruckes, 1957)

Figs 2, 19–26, 78

Platycarenus (*Discocephalessa*) *tenebricornis* Ruckes, 1957: 16–17.
Lineostethus tenebricornis: Ruckes (1966: 24); Hildebrand and Becker (1982: 778–780).

Diagnosis. The specimens of *L. tenebricornis* may have brown antennae, also observed in *L. auritus* sp. nov. and *L. otarus* sp. nov. The males of *L. tenebricornis* are recognized by the subquadrangular foliaceous expansions of the dorsal rim of pygophore, covering dorsally the posterolateral angles (Figs 19–21: fdr, pa); the projections of the superior layer of ventral rim elongate and rounded at apex (the last feature similar to *L. graziae*) (Figs 21, 39: psl); the presence of two lines of short bristles below the projections of the superior layer of ventral rim (Figs 20–21: b); and the apical margin of vesica along with the ductus seminis distalis (Fig. 24: av, ds). In the females, diagnostic features are the posterior margin of urosternite VII subrectilinear on its median third along with subrectangular gonocoxites VIII (Fig. 25: VII, gcVIII); and the thickening of gonapophysis IX subrectangular with a median constriction, combined with a subtriangular thickening of vaginal intima (Fig. 25: tgIX, vi). The median third of the posterior margin of urosternite VII and the subtriangular thickening of vaginal intima are also found in *L. otarus* sp. nov. However, *L. tenebricornis* has shallower genital plates than *L. otarus* sp. nov. (Figs 25, 68), and the thickenings of gonapophysis IX have different shapes (Figs 26, 69: tgIX, vi).

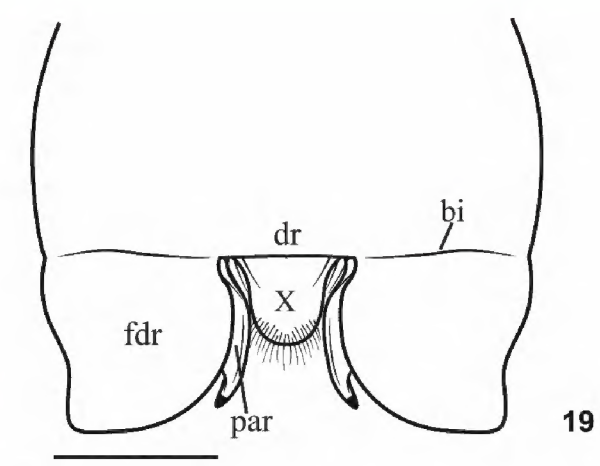
Redescription. Antennal segments usually brown, sometimes ivory with longitudinal brown line on segments I–II; segment III usually longer than II. Anterolateral margins of pronotum and proximal portion of lateral margin of corium punctured. Unpunctured area laterad to the apex of radial vein of coria smaller than the width of one eye. Hemelytral membrane at least reaching the apex of abdomen, with 8 veins. Ventrally, punctures uniformly distributed. Femora with brown circular spots on the entire length or concentrated on distal half.

Male genitalia. Foliaceous expansions of dorsal rim subquadrangular; apex of expansions surpassing the posterior limit of ventral rim, hiding the posterolateral angles (Fig. 19: fdr). Basal impression of the foliaceous expansions subrectilinear, cutting of dorsal rim subrectangular, filled by the parameres and segment X (Fig. 19: bi, dr, pa, X). Posterolateral angles with sinuous apex (Figs 20–21: pa). Margin of the superior layer of ventral rim concave, median excavation U-shaped (Fig. 20: vr). Margin of the inferior layer of ventral rim with two subrectilinear lines of short bristles (Figs 20–21: b). Projections of the superior layer of ventral rim forming a right angle with the posterolateral angles; projections thin at base, median portion enlarged, and apex elongate; setae on the posterior margin of the projections (Fig. 21: psl, pa). Apex of parameres diverging, reaching or surpassing the foliaceous expansions of dorsal rim; head subtriangular with acute apex (Figs 21–23: par, X, fdr). Ventral surface of phallotheca concave (Fig. 24: ph, ap). Vesica more sclerotized on middle and over the ductus seminis distalis; apex of vesica concave; apical margin, concave, accompanying the ductus seminis distalis (Fig. 24: v, av, ds). Distal portion of ductus seminis distalis shorter than vesica (Fig. 24: ds).

Female genitalia. Posterior margin of urosternite VII slightly sinuous, middle third subrectilinear and lateral thirds convex (Fig. 25: VII). Gonocoxites VIII subrectangular; posterior margin slightly convex and sutural angles weakly divergent and basal two thirds of sutural margins juxtaposed (Fig. 25: gcVIII). Posterior margin of laterotergites VIII convex and limit between laterotergites VIII and tergite VIII indistinguishable (Fig. 25: la8). Posterior margin of gonocoxites IX slightly concave (Fig. 25: gcIX). Laterotergites IX digitiform (Fig. 25: la9). Posterior margin of segment X subrectilinear to concave (Fig. 25: X). Thickening of gonapophyses IX subrectangular narrowed medially, surpassing the lateral margin of the thickening of vaginal intima (Fig. 26: gpIX, tgIX). Thickening of vaginal intima subtriangular (Fig. 26: vi). Distal portion of ductus receptaculi medially sclerotized and enlarged (Fig. 26: ddr); anterior annular crest perpendicular to pars intermedialis; pars intermedialis sclerotized on basal two thirds and subequal to capsula seminalis in length; posterior annular crest turned to capsula seminalis (Fig. 26: pi, cs). Capsula seminalis with slight basal constriction (Fig. 26: cs).

Measurements. Male (n = 5): head length, 1.59 ± 0.05 (1.53–1.68); width, 2.96 ± 0.04 (2.88–3.01); length of antennal segments: I, 0.44 ± 0.04 (0.42–0.48); II, 0.76 ± 0.06 (0.72–0.82); III, 0.79 ± 0.06 (0.70–0.86); IV, 0.96 ± 0.05 (0.88–1.00); V, 1.17 ± 0.05 (1.08–1.22); length of labial segments: I, 0.76 ± 0.01 (0.76–0.78); II, 1.58 ± 0.05 (1.50–1.64); III, 0.68 ± 0.05 (0.62–0.74); IV, 0.51 ± 0.02 (0.50–0.54); pronotum length, 1.72 ± 0.06 (1.66–1.80); width, 4.24 ± 0.13 (4.10–4.45); scutellum length, 3.30 ± 0.20 (3.04–3.52); width, 2.71 ± 0.05 (2.67–2.79); total length, 6.82 ± 0.12 (6.67–7.03); abdominal width, 4.83 ± 0.12 (4.65–4.95).

Female (n = 5): head length, 1.56 ± 0.06 (1.5–1.63); width, 2.99 ± 0.08 (2.91–3.10); length of antennal segments: I, 0.43 ± 0.02 (0.40–0.46); II, 0.81 ± 0.04 (0.78–0.86); III, 0.82 ± 0.04 (0.80–0.86); IV, 1.02 ± 0.06 (1.00–1.12); V, 1.10 ± 0.20 (0.90–1.28); length of labial segments: I, 0.82 ± 0.04 (0.76–0.88); II, 1.60 ± 0.03 (0.02–1.64); III, 0.73 ± 0.03 (0.70–0.78); IV, 0.56 ± 0.03 (0.54–0.60); pronotum length, 1.89 ± 0.07 (1.82–1.98); width, 4.47 ± 0.08 (4.40–4.60); scutellum length, 3.66 ± 0.08 (3.60–3.80); width, 2.80 ± 0.16 (2.79–2.95); total length, 8.21 ± 0.74 (6.96–8.90); abdominal width, 5.10 ± 0.22 (5.00–5.48).



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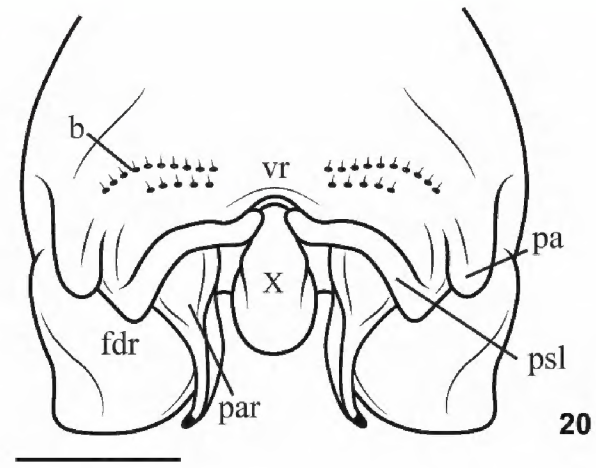

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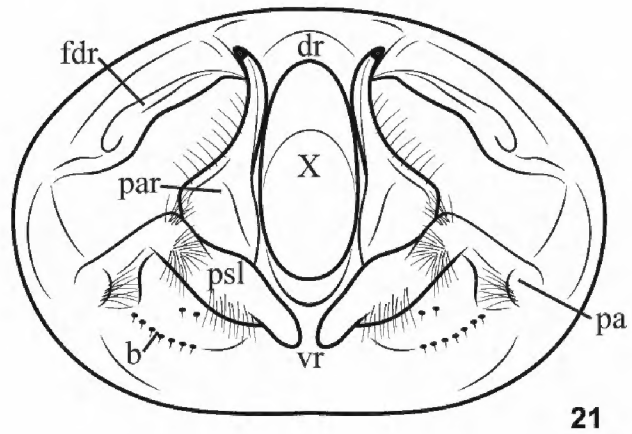

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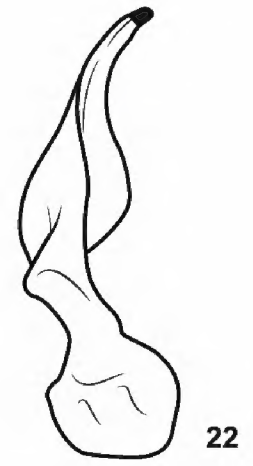
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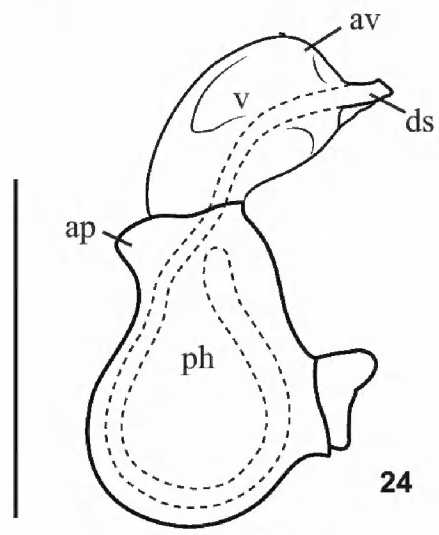

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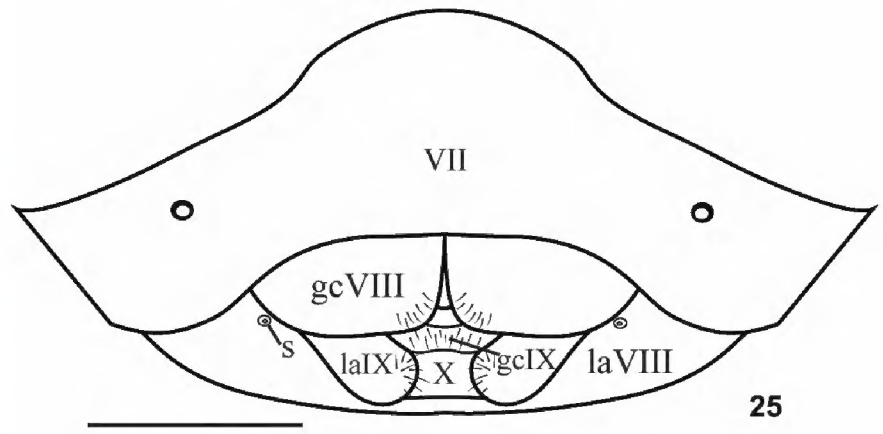

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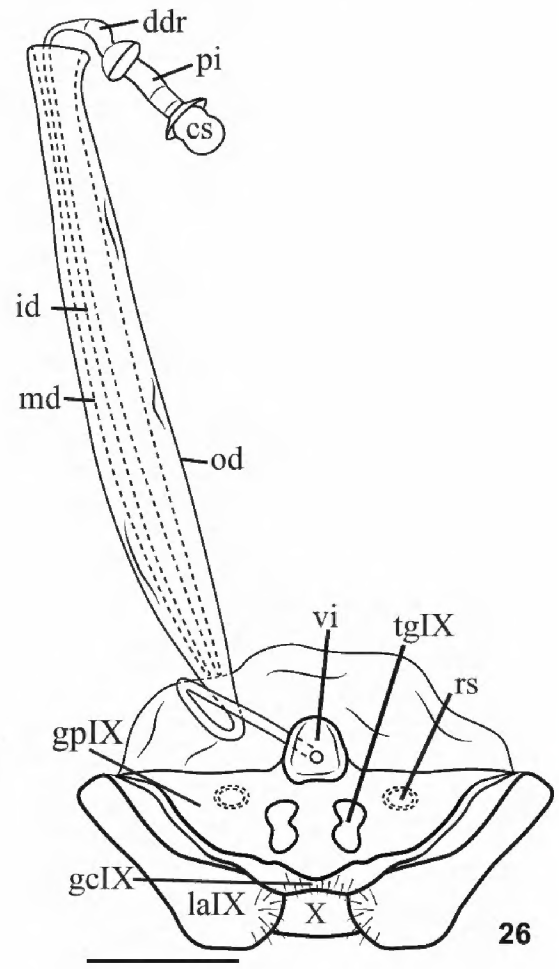

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Figures 19–26. *Lineostethus tenebricornis*: (19–21) male pygophore, dorsal, ventral and posterior views respectively; (22–23) left paramere, dorsal and lateral views; (24) phallus, lateral view; (25) female genital plates; (26) female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 19–23, 25 = 1 mm; 24, 26 = 0.5 mm.

Material examamined. Paratypes: USA, *Arizona*: San Rita Mt, 1 female, 11-VII-1932, E.D. Ball leg. (AMNH); Madera Cyn. (Sta Rita Mts Pima Co.), 1 male, 13-VIII-1952, M. Cazier, R. Schrammel, C. & P. Vaurie leg. (CAS); Runaway Canyon Huachuca mts., 1 female, 15-I-1941 (AMNH); Huachuca Mts. (Rd to Petersens Rch), 1 female, 17-VIII-1940, E.C. Van Dyke leg. (CAS); Atascosa Mt., 1 female, 19-VII-1935, E.D. Ball leg. (AMNH). Other specimens: USA, *Arizona*: (Nr Oracle), 1 female, 14-VII-1940 (CAS); Sabino Cañon, Santa catalina Mts (4200 ft, on wild cotton), 1 male, 28-XI-1913, HSB leg.(USNM); (Cave Cr Chiricahua Mts.), 1 male and 2 females, 4-VII-1930, Pres. By. G. Linsley Collector leg. (CAS); (Cave Crk. Chiricahua Mts.), 1 male, 20-VI-1932, J.O. Martia leg. (CAS); Cochise Co., (Chiricahua Mts Horseshoe Cany), 6 males and 6 females, 4-VII-1977, Scott McCleve leg. (AMNH); Cochise Co., (Chiricahua Mts Horseshoe Cany), 1 male, 4-VII-1977, Scott McCleve, M. Cazier, R. Schrammel, C. & P. Vaurie Collectors leg. (AMNH); Cochise Co. Chiricahua Mts. (South Fork), 1 male and 1 female, 12-VIII-1978, Duane/Pam Flynn leg. (DARC); Cochise Co. Chiricahua Mts. (South Fork), 1 female, 12-VIII-1978, Duane/Pam Flynn leg. (DARC); Cochise Co. Huachuca Mts (Ash. Canyon, 5600-6000), 1 male, 29-VII-1979, W.F.Barr leg. (DARC); Cochise Co. Huachuca Mts (Ash. Canyon, 5600-6000), 1 female, 29-VII-1979, W.F.Barr leg. (DARC); Huachuca Mts, 1 female, 3-VII-2005 (CAS); Huachuca Mts, 1 male, 16-VII-2005 (CAS); Huachuca Mts. (Rd to Petersens Rch), 2 males and 1 female, 17-VIII-1940, E.C. Van Dyke leg. (CAS); Huachuca Mts. (Carr Cn), 2 males and 1 female, 7-VIII-1924, E.P. Van Duzee leg. (CAS); Huachuca Mts, 1 male, VII-1905, H.G. Barber Colln 1950 leg. (USNM); Cochise Co. (Cave Creek Cyn. 3 mi WE Portal), 1 male, 6-IX-1979, H.A.Hespenheide leg. (DARC); Cochise Co. (SW Res. Sta. 5mi W Portal), 5 females, 10-11-VIII-1983, E.G. & M. Riley leg. (DARC); Cochise Co. Chiracahua Mtns (Cave CK.), 1 female, 27-VIII-1983, D.B.Thomas leg. (DARC); Cochise Co. Chiracahua Mtns (Cave CK.), 1 male, 27-VIII-1983, D.B.Thomas leg. (DARC); Madera Cn., (Santa Rita Mts. Santa Cruz Co. 6200ft.), 2 males and 3 females, 1-2-VIII-1952, H.B. Leech & J.W. Green Collectors leg. (CAS); Florida Cn., 2 males, 10-VIII-1924, Santa Rita Mts, E.P. Van Duzee Collector leg. (CAS); Palmerlei, 1 female, July, H.G. Barber Collector leg. (USNM); (Camp Washington Patagonia Mts.), 1 male, 22-VI-1948, H.S.B. Barber leg. Request 1950 (USNM).

Distribution (Fig. 78). USA: Arizona (Ruckes 1957, 1966, Hildebrand and Becker 1982). Mexico: *Michoacán* (Hildebrand and Becker 1982).

Remarks. From the data retrieved of specimens' labels, cotton (*Gossypium hirsutum* L., Malvaceae) is a possible host plant.

Lineostethus marginellus (Stål, 1872)

Figs 3, 27–36, 78

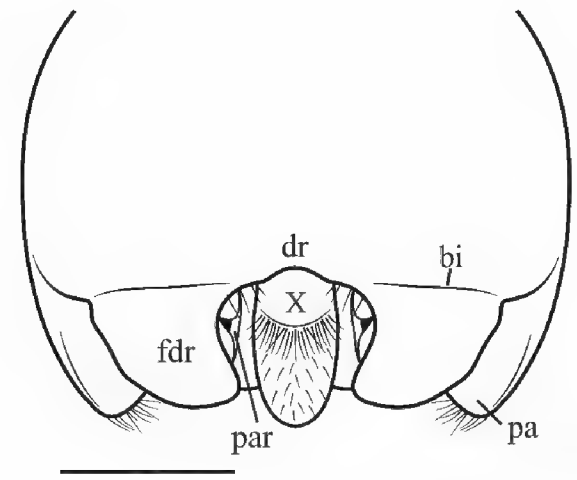
Discocephala marginella Stål, 1872: 6; Distant (1880: 45, plate 5, fig.2); Uhler (1886: 5); Lethierry and Severin (1893: 84); Banks (1910: 92).
Platycarenus (*Discocephalessa*) *marginellus*: Kirkaldy (1909: 215).
Lineostethus clypeatus marginellus: Ruckes (1966: 26).
Lineostethus marginellus: Hildebrand and Becker (1982: 778–780).

Diagnosis. Males of *L. marginellus* differ from the other species by the subrectangular foliaceous expansions of the dorsal rim of pygophore (Fig. 27: fdr); and the projections of the superior layer of ventral rim acute at apex and forming an acute to right angle with the posterolateral angles (Figs 29–31: psl). In this species the enlargement of the median portion of the projections of the superior layer of the ventral rim is variable (Figs 29–31: psl), and consequently their apex length and shape also vary a little. The foliaceous expansions of the dorsal rim are subrectangular as in *L. acuminatus* sp. nov. but the species differ by the projections of ventral rim and by the phallus. The females are like *L. clypeatus* in the general shape of the genital plates, however in *L. marginellus* the gonocoxites VIII are longer (Figs 17, 35: gcVIII). Also, the sinuous thickening of gonapophysis IX, the subrectangular thickening of the vaginal intima, and the enlarged and straight ductus receptaculi distal are diagnostic and differ *L. marginellus* from *L. clypetus* (Figs 36: tgIX, vi, ddr).

Redescription. Antennal segments II–III with longitudinal brown line. Anterolateral pronotal margins and proximal portion of lateral margin of corium punctured in some specimens. Scutellum sometimes with a spot of brown punctures on disc and on post-frenal lobe. Unpunctured area laterad to the apex of radial vein of coria subequal to the width of one eye or inconspicuous. Hemelytral membrane slightly surpassing the apex of abdomen, with 6–7 veins. Ventrally, punctures sparse and concentrated laterally. Femora with sparse brown circular spots on apical half.

Male genitalia. Foliaceous expansions of dorsal rim subrectangular; apex of expansions not surpassing the posterior limit of ventral rim; posterolateral angles visible dorsally (Fig. 27: fdr, pa). Basal impression of the foliaceous expansions subrectilinear, cutting of dorsal rim U-shaped (Fig. 27: bi, dr). Posterolateral angles with rounded apex, sometimes with setae on the posterior margin (Fig. 27: pa). Margin of the superior layer of ventral rim sinuous, median excavation narrow and drop-shaped (Fig. 28: vr). Margin of the inferior layer of ventral rim with one arc of short bristles (Fig. 28: b). Projections of the superior layer of ventral rim forming an acute to right angle with the posterolateral angles; projections covered by setae on the posterior margin, base and median portions enlarged, apex acute (Figs 29–31: psl, pa); posterior surface of the projections usually depressed. Parameres parallel to segment X, usually projected over the cutting of the dorsal rim; head lozenge (Figs 29, 32–33: par, dr, X). Ventral surface of phallotheca subrectilinear (Fig. 34: ph, ap). Vesica apical margin sinuous, extending to mid of ductus seminis distalis (Fig. 34: v, av, ds). Distal portion of ductus seminis distalis half the length of vesica; uniformly wide (Fig. 34: ds).

Female genitalia. Posterior margin of urosternite VII concave (Fig. 35: VII). Gonocoxites VIII subtriangular; posterior margin



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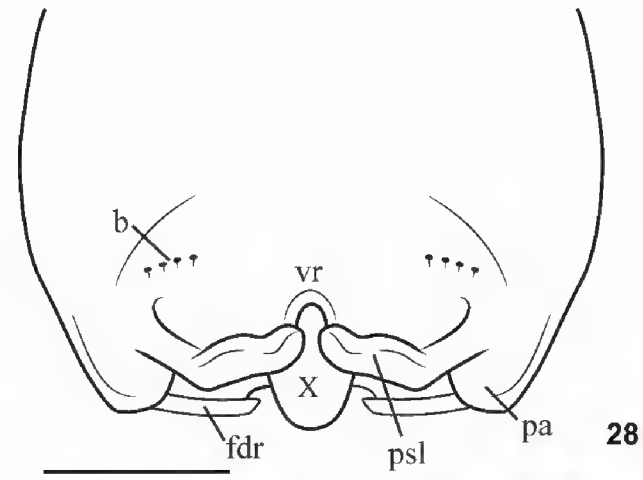

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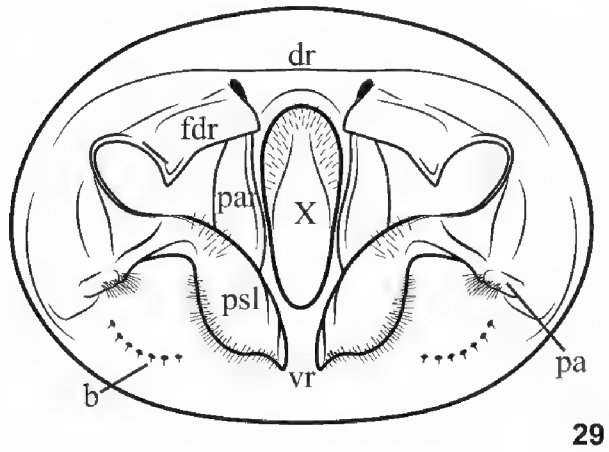

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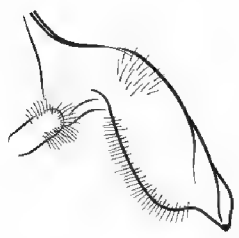
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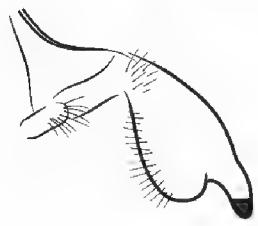
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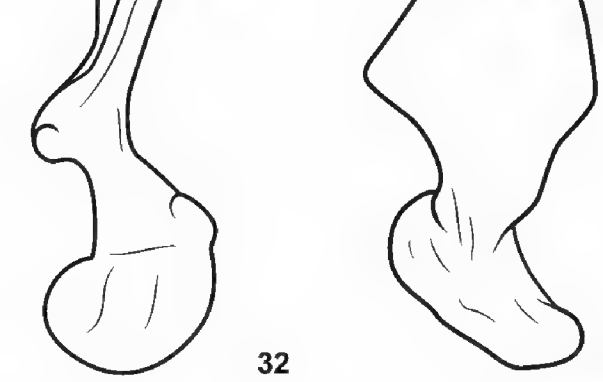
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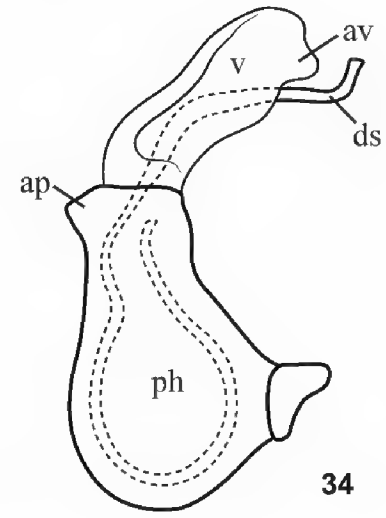

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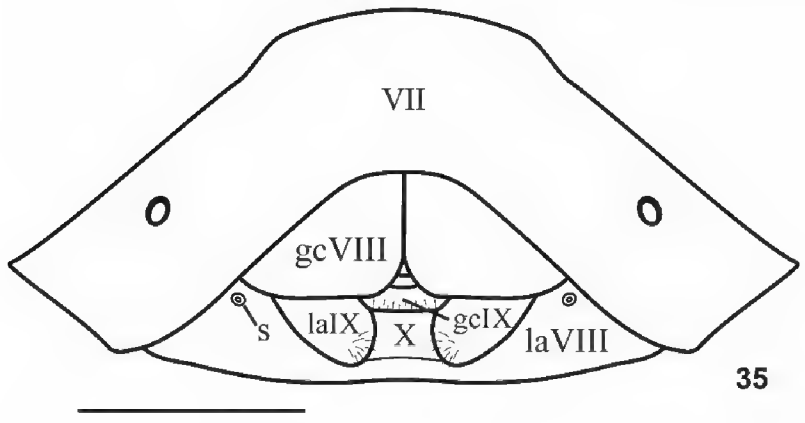

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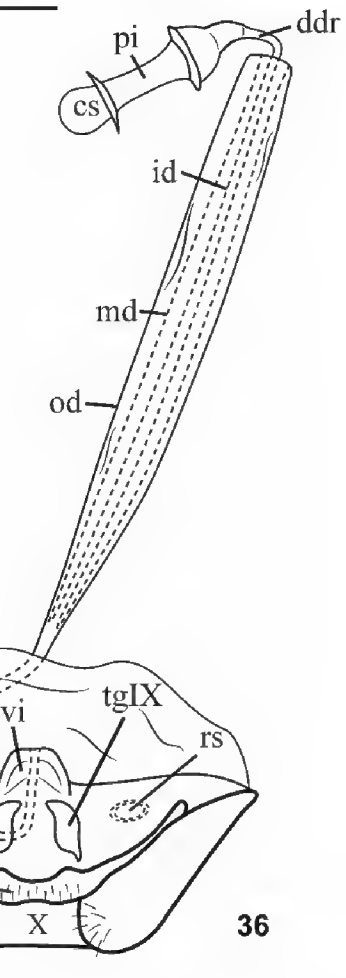

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Figures 27–36. *Lineostethus marginellus*: (27–29) male pygophore, dorsal, ventral and posterior views respectively; (30–31) variations on the shape of the projections of superior layer of ventral rim; (32–33) left paramere, dorsal and lateral views; (34) phallus, lateral view; (35) female genital plates; (36) female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 27–33, 35 = 1 mm; 34, 36 = 0.5 mm.

subrectilinear (Fig. 35: gcVIII). Posterior margin of laterotergites VIII subrectilinear; limit between laterotergites VIII and tergite VIII indistinguishable (Fig. 35: la8). Posterior margin of gonocoxites IX subrectilinear (Fig. 35: gcIX). Laterotergites IX subtriangular, mesial margin slightly convex. Posterior margin of segment X slightly concave (Fig. 35: X). Thickening of gonapophyses IX sinuous, surpassing the lateral margin of the thickening of vaginal intima (Fig. 36: gpIX, tgIX). Thickening of vaginal intima subquadrangular (Fig. 36: vi). Distal portion of ductus receptaculi enlarged and more sclerotized; anterior and posterior annular crests perpendicular to pars intermedialis; pars intermedialis almost twice the length of capsula seminalis (Fig. 36: ddr, pi, cs).

Measurements. Male (n = 5): head length, 1.53 ± 0.04 (1.48–1.60); width, 3.03 ± 0.11 (2.88–3.16); length of antennal segments: I, 0.42 ± 0.02 (0.40–0.44); II, 0.70 ± 0.06 (0.64–0.78); III, 0.67 ± 0.09 (0.54–0.80); IV, 0.84 ± 0.03 (0.80–0.86); V, 1.01 ± 0.04 (0.98–1.06); length of labial segments: I, 0.66 ± 0.04 (0.60–0.70); II, 1.37 ± 0.08 (1.30–1.50); III, 0.64 ± 0.04 (0.60–0.68); IV, 0.43 ± 0.03 (0.40–0.46); pronotum length, 1.70 ± 0.08 (1.60–1.80); width, 4.07 ± 0.33 (3.80–4.65); scutellum length, 3.30 ± 0.08 (3.20–3.40); width, 2.61 ± 0.11 (2.48–2.76); total length, 6.48 ± 0.28 (6.11–6.82); abdominal width, 4.35 ± 0.17 (4.20–4.55).

Female (n = 5): head length, 1.58 ± 0.04 (1.52–1.64); width, 3.08 ± 0.12 (3.04–3.28); length of antennal segments: I, 0.40 ± 0.01 (0.38–0.42); II, 0.76 ± 0.07 (0.70–0.84); III, 0.75 ± 0.07 (0.64–0.82); IV, 0.90 ± 0.10 (0.80–1.00); V, 1.11 ± 0.09 (1.00–1.24); length of labial segments: I, 0.66 ± 0.08 (0.58–0.78); II, 1.35 ± 0.16 (1.30–1.52); III, 0.61 ± 0.08 (0.52–0.70); IV, 0.44 ± 0.04 (0.40–0.50); pronotum length, 1.80 ± 0.15 (1.60–1.94); width, 4.24 ± 0.38 (3.72–4.65); scutellum length, 3.50 ± 0.23 (3.20–3.76); width, 2.77 ± 0.23 (2.45–3.04); total length, 7.67 ± 0.95 (6.39–8.60); abdominal width, 4.80 ± 0.55 (4.30–5.54).

Material examined. Lectotype male: MEXICO, Sallé – type, *marginella* Stål – Paratypus, 82 81 – Lectotype *Discocephala marginella* Stål, 1872 – NHRS-GULI 000011383 (NHRS – photographs examined). Paralectotype female: MEXICO, Sallé – type – Typus, 81 81 – NHRS-GULI 000011382 (NHRS – photographs examined). Other specimens: USA, *Arizona*: Portal Cochise Co., 1 female, 14-19-VIII-1965, W.J. Gertsch Collector leg. (AMNH); Camp Washington Patagonia Mts, 4 females, 22-VI-1948, HSB Barber Request 1950 leg. (USNM); *Texas*: Star Co. (along Rio Grande at. Salineño), 1 female, 27-X-1991, E.G.Riley leg. (DARC); Cameron Co, 1 male, 8-III-1929, R.H. Beamer leg. (UFRG); Cameron Co. (Sabal Palm Grove Sanct.), 2 males, 28-29-III-1986, E.G. Riley leg. (DARC); Cameron Co. (Sabal Palm Groove Sanct.), 1 male, 4-X-1986, E.Riley & J.Negrón leg. (DARC); Cameron Co. (Sabal Palm Grove Audi. Sanct.), 2 males, 3-V-1987, E.Riley & Whitford leg. (DARC); Cameron Co. (Sabal Palm Grove Sanct.), 1 male, 5-IV-1987, E.Riley & D.Rider leg. (DARC); Cameron Co. (Sabal Palm Grove Sanct), 2 males and 2 females, 26-X-1991, E.G.Riley leg. (DARC); Cameron Co. (Paloma Blanca rd., nr. Sabal Palm Grove Sanct), 1 female, 26-X-1991, E.G.Riley leg. (DARC); Cameron Co., Brownsville (Sabal Palm Grove), 2 males, 14-IX-1982, C.W. & L.O'Brien & G. Wibmer leg. (DARC); Brownsville, 1 male, 3-VI-1932 (CAS); Brownsville, 1 female, 3-VI-1932, J.O. Martin leg. (CAS); Brownsville (Esper Rch), 1 male, no date (USNM); Brownsville, 1 male, June 1901, H.G. Barber Colln 1950 leg. (USNM). MEXICO, *Tamaulipas:* (Hwy. 80, 8mi W Jen. Hwys. 80 & 85, 1100), 1 male, 19-VI-1983, C.W. & L.O'Brien & G.B.Marshall leg. (DARC); (4 mi W Cd. Victoria, Canon del Navillo), 1 female, 14-XI-1985, P.Kovarik R.Jones & K.Haack leg. (DARC); *San Luis Potosi*: (10 Mi N. Tamazunchale), 1 female, 24-XII-1940, G.E. Bohart leg. (CAS); (Hwy. 85, 8mi SW Tamazunchale, 600), 1 female, 24-VII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); Vera Cruz Crawford, 1 male, no date (CAS); (7 mi N of San Juanito nr. Santos, Route 85, about 15mi S. of Ciudad Valles), 1 male, 23-IV-1965, H.V. Weems Jr. Cool leg. (DARC); *Veracruz*: Catemaco (Playa Azul), 1 male, 9-VIII-1966, J. & W. Ivie leg. (AMNH); (5mi E Catamaco), 1 female, 2-4-VII-1971, Clack Murray Hart Schaffner leg. (DARC); Acuyucan, 1 male, VIII-1966 J. & W. Ivie leg. (AMNH); 50' Montepio, 1 male and 2 females, 23-VIII-1982, C.W. & L.O'Brien & G. Wibmer leg. (DARC); (4 mi S Sontecomapan, 150), 2 females, 23-VIII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); *Hidalgo*: Otongo (3400), 1 female, 1-VIII-1982, O'Brien leg. (DARC); Otongo (3400, Minera Autlan), 1 male, 1-VIII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); *Colima*: (Hwy. 54, 24 mi W Manzanillo), 1 female, 9-VIII-1982, C.W. & L.O'Brien & G.Wibmer leg. (DARC); *Oaxaca*: (Hwy 147, 6 mi SE Jcn 175 & 147, 200), 1 male, C.W. & L.O'Brien & G.Wibmer leg. (DARC); *Tabasco*: (38 mi E Cardenas), 1 male, 4-X-1976, Cate & Clark leg. – beating flowers *Hampea nutricea* [sic] (male) (DARC); *Chiapas*: Hwy 307 (off Rd to Lacanja, 403m, 16.93°N 91.26°W), 3 males and 5 females, 07-VII-2009, D. Forero & G. Zhang leg. (UFRG); (in bananas, intercept N. Orleans US), 1 male, 19-II-1976 (USNM). HONDURAS, *Cortes*: (5 km N Cofradia), 1 male, 5-VIII-1977, C.W. & L.O'Brien & Marshall leg. PANAMA, *Los Santos*: Taboga, 1 female, XIII-1953, N.L.H. Kraus leg. (AMNH).

Distribution (Fig. 78). USA: *Arizona* (**new record**), *Texas* (Ruckes 1966; Hildebrand and Becker 1982). Mexico: *Nuevo León* (Ruckes 1966), *Tamaulipas* (**new record**), *San Luis Potosi* (**new record**), *Veracruz* (Ruckes 1966), *Hidalgo* (**new record**), *Tabasco* (**new record**), *Chiapas* (Hildebrand and Becker 1982). Honduras: *Cortes* (**new record**). Panama: *Los Santos* (**new record**).

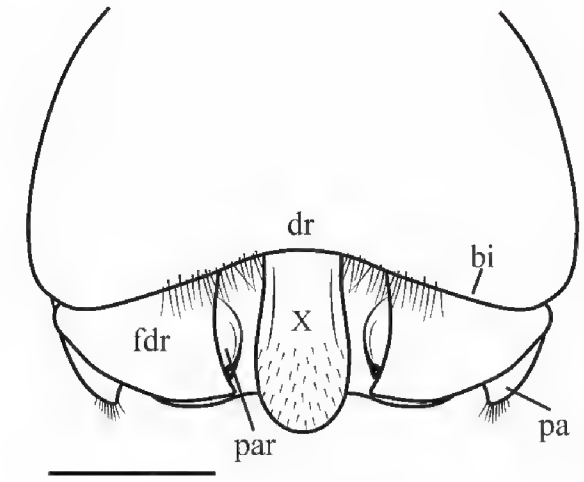
Remarks. From the data retrieved of specimens' labels, banana (*Musa paradisiaca* L., Musaceae) and flowers of *Hampea nutricia* Fryxell (Malvaceae) are possible host plants.

Lineostethus graziae Hildebrand & Becker, 1982

Figs 4, 37–44, 78

Lineostethus graziae Hildebrand & Becker, 1982: 775–778.

Diagnosis. The males of *L. graziae* differ from other species by the subtriangular foliaceous expansions of the dorsal rim, the



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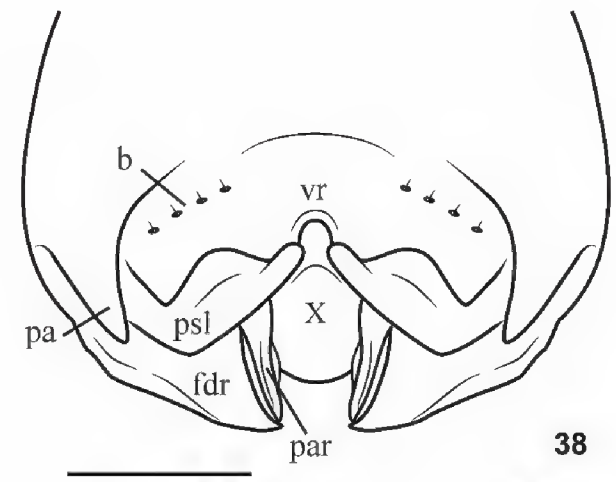

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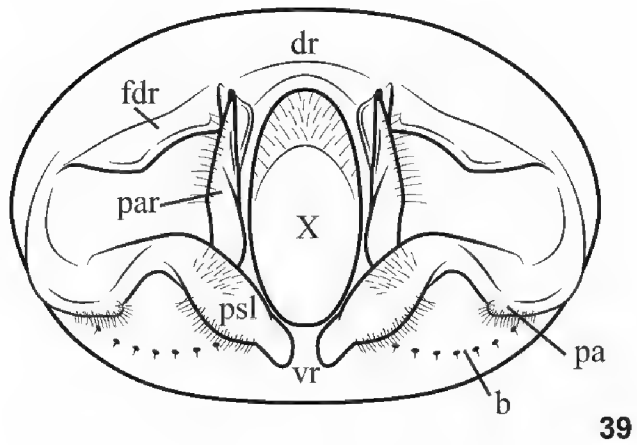

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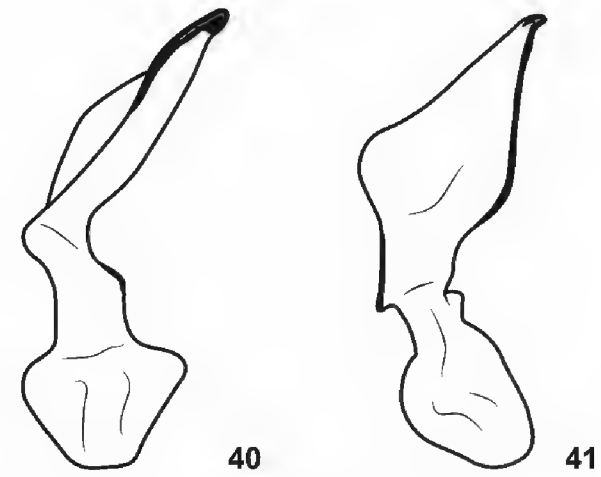

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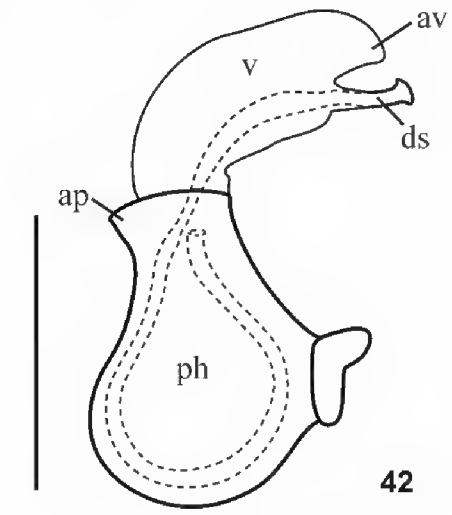

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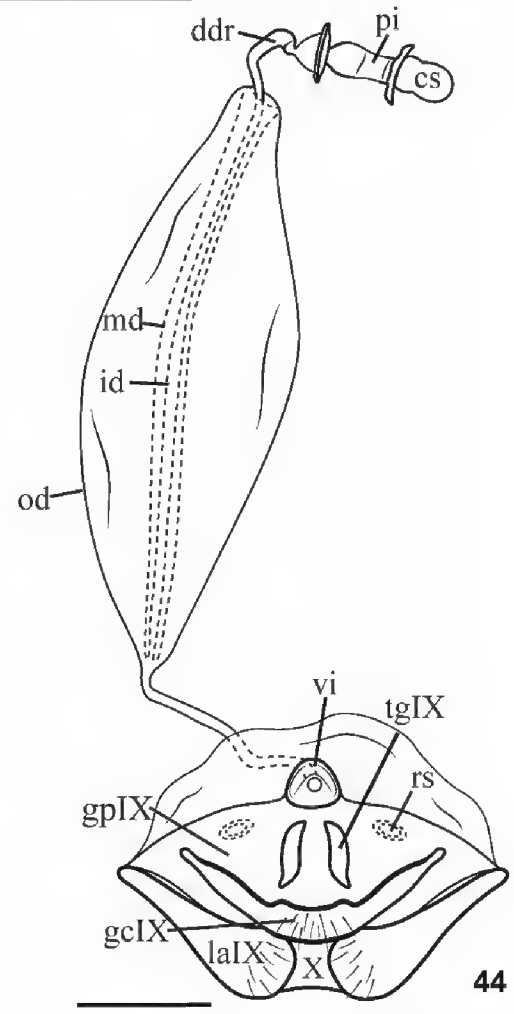

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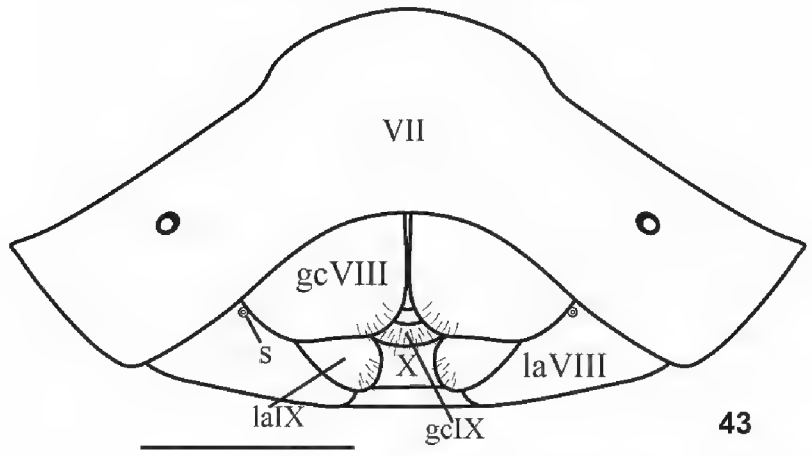

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Figures 37–44. *Lineostethus graziae*: (37–39) male pygophore, dorsal, ventral and posterior views respectively; (40–41) left paramere, dorsal and lateral views; (42) phallus, lateral view; (43) female genital plates; (44) female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 37–41, 43 = 1 mm; 42, 44 = 0.5 mm.

subquadrangular cutting of the dorsal rim, the acute posterolateral angles (Fig. 37: fdr, dr, pa), the projections of the superior layer of ventral rim rounded at apex (Fig. 39: psl), and the ductus seminis distalis enlarged at apex (Fig. 42: ds). Subtriangular foliaceous expansions of the dorsal rim are also seen in *L. sinuosus* sp. nov., but the cutting of the dorsal rim, the posterolateral angles, and the projections of the ventral rim are different, as well as the phallus (Figs 37–39, 42, 45–47, 50: fdr, dr, pa). The females are distinguished by the subquadrangular gonocoxites VIII, the posterior margin of gonocoxites IX slightly concave (Fig. 43: gcVIII, gcIX), the enlarged distal portion of the ductus receptaculi, and the median constriction in the capsula seminalis (Fig. 44: ddr, cs). In the original description of *L. graziae*, Hildebrand and Becker (1982) described the connexival margins with large black strips, made of two lines of black punctures. However, the two specimens we found have thin strips, made of one line of black punctures.

Redescription. Antennal segments I–IV with longitudinal brown lines. Anterolateral margins of pronotum and proximal portion of lateral margin of corium without punctures. Unpunctured area laterad to the apex of radial vein of coria smaller than the width of one eye. Hemelytral membrane surpassing the apex do abdomen, with 7 veins. Anterior and posterior margins of connexival segments with one or two lines of black punctures (Fig. 4). Ventrally, punctures sparse and concentrated laterally or gradually dispersed toward the midline. Femora with sparse brown circular spots on distal half.

Male genitalia. Foliaceous expansions of dorsal rim subtriangular; apex of expansions not surpassing the posterior limit of ventral rim; posterolateral angles visible dorsally (Fig. 37: fdr, pa). Basal impression of the foliaceous expansions sinuous, cutting of dorsal rim subquadrangular, housing the apex of parameres (Fig. 37: bi, dr, par). Posterolateral angles with subtriangular apex (Figs 37–38: pa). Margin of the superior layer of ventral rim slightly concave, median excavation U-shaped (Fig. 38: vr). Margin of the inferior layer of ventral rim with one arc of short bristles (Fig. 38–39: b). Projections of the superior layer of ventral rim forming an acute angle with the posterolateral angles; projections with base and median portion enlarged and tapering to apex, covered by setae; apex rounded (Fig. 39: psl, pa). Parameres tangent to segment X, reaching the foliaceous expansions of dorsal rim; head lozenge (Figs 39–41: par, X; dr, fdr). Ventral surface of phallotheca concave (Fig. 44: ph, ap). Vesica with rounded apex, apical margin rounded and placed along ductus seminis distalis almost to its apex (Fig. 42: v, av, ds). Distal portion of ductus seminis distalis subequal to vesica in length, enlarged at apex (Fig. 42: ds).

Female genitalia. Posterior margin of urosternite VII concave (Fig. 43: VII). Gonocoxites VIII subquadrangular; apex slightly divergent; posterior margin convex (Fig. 43: gcVIII). Posterior margin of laterotergites VIII convex; limit between laterotergites VIII and tergite VIII visible (Fig. 43: la8). Posterior margin of gonocoxites IX convex (Fig. 43: gcIX). Laterotergites IX digitiform, mesial margins divergent (Fig. 43: la9). Posterior margin of segment X subrectilinear (Fig. 43: X). Thickening of gonapophyses IX sinuous, not surpassing the lateral margin of the thickening of vaginal intima (Fig. 44: gpIX, tgIX). Thickening of vaginal intima subtriangular, flat (Fig. 44: vi). Distal ductus recepitaculi sclerotized and enlarged; annular crests perpendicular to pars intermedialis; middle third of pars intermedialis less sclerotized (Fig. 44: ddr, pi, cs). Capsula seminalis subequal to pars intermedialis in length, bearing median constriction (Fig. 44: cs).

Measurements. Male (n = 1): head length, 1.60; width, 3.20; length of antennal segments: I, 0.44; II–V, missing; length of labial segments: I, 0.72; II, 1.56; III, 0.68; IV, 0.46; pronotum length, 1.72; width, 4.26; scutellum length, 3.56; width, 2.79; total length, 7.10; abdominal width, 4.50.

Female (n = 1): head length, 1.70; width, 3.40; length of antennal segments: I, 0.42; II, 0.78; III, 0.80; IV, 0.88; V, 0.98; length of labial segments: I, 0.78; II, 1.40; III, 0.70; IV, 0.58; pronotum length, 1.96; width, 3.56; scutellum length, 3.88; width, 3.80; total length, 8.70; abdominal width, 4.98.

Material examined. Holotype (female): MEXICO, *Oaxaca*: Totolapan (19 mi NW), 28-VII-1963, Collr: W. A. Foster leg. – California Academy of Sciences Type No. 15923 (CAS). Paratypes: MEXICO, *Morelos*: Cuernavaca (10mi E), 1 female, 31-VII-1963, W. A. Foster leg., CIS (EMEC – photographs examined); *Oaxaca*: Totolapan (19 mi NW), 2 males and 1 female, 28-VII-1963, W. A. Foster leg., CIS (EMEC – photographs examined). Other specimens: GUATEMALA, *Sacatepequez*: Capetillo (5000 ft), 1 male, 21-VIII-1947, F. Johnson Donor, Cols. C. & P. Vaurie leg. (AMNH); Antigua (1500-1600 mi), 1 female, June 1981, N.L.H. Krauss leg. (AMNH).

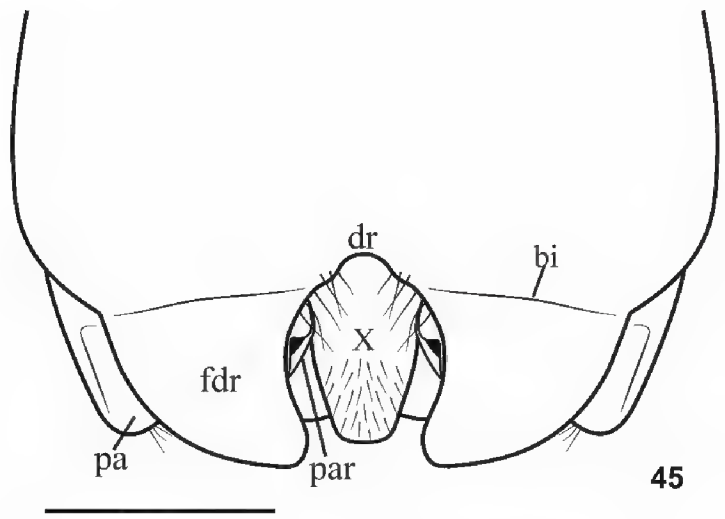
Distribution (Fig. 78). Mexico: *Morelos*, *Puebla*, *Oaxaca* (Hildebrand and Becker 1982). Guatemala: *Sacatepequez* (**new record**).

Remarks. Hildebrand and Becker (1982) indicated the Essig Museum of Entomology in the University of California Berkeley (EMEC) as deposit collection for the female holotype of *L. graziae*, but it is in the California Academy of Sciences under the type number 15923 and was examined by T.A.G.

Lineostethus sinuosus Kochenborger & Garbelotto, sp. nov.

http://zoobank.org/3786A48C-3F2B-4137-B1EC-EEBC72E9EC99
Figs 5, 45–53, 78

Diagnosis. The males of *L. sinuosus* sp. nov. differ from other species by the subrectangular expansions of the dorsal rim of pygophore, though it is similar in shape with *L. marginellus* whose dorsal rim cutting is wider (Figs 27, 45: fdr). The median portion of the projections of the superior layer of ventral rim in *L. sinuosus* sp. nov. is also the widest among the species with projections spatulate at apex (Fig. 47: psl). The females of *L. sinuosus* sp. nov. can be recognized by the sinuous posterior margin of gonocoxites VIII (Figs 51–52: gcVIII), and although a sinuous outline is also observed in *L. otarus* sp. nov. and *L. auritus* sp. nov. (Figs 68, 76: gcVIII), the strongly divergent



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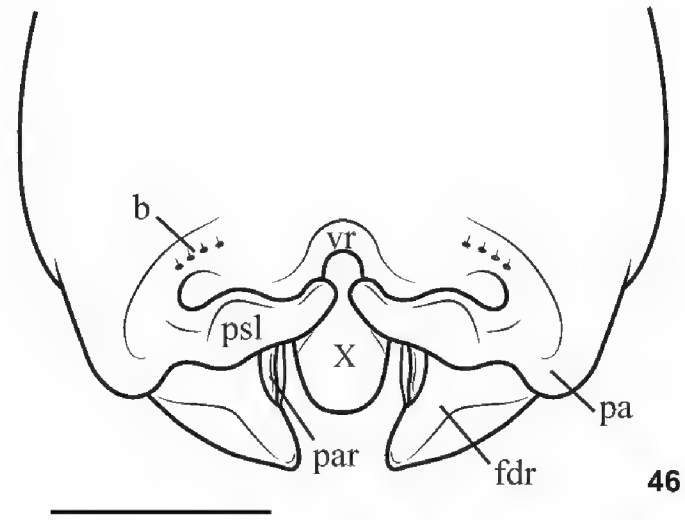

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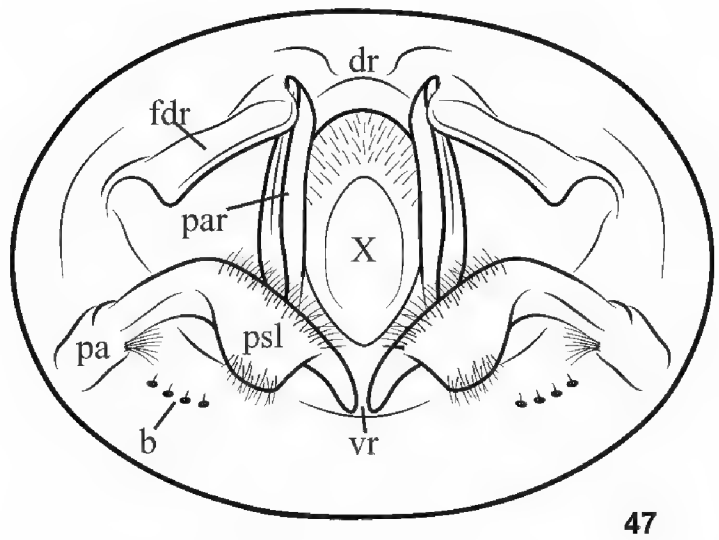

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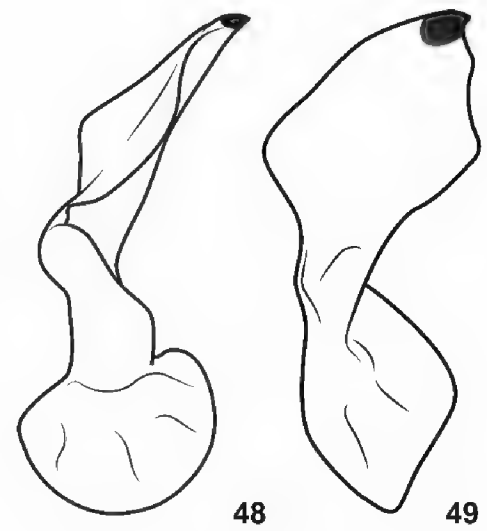
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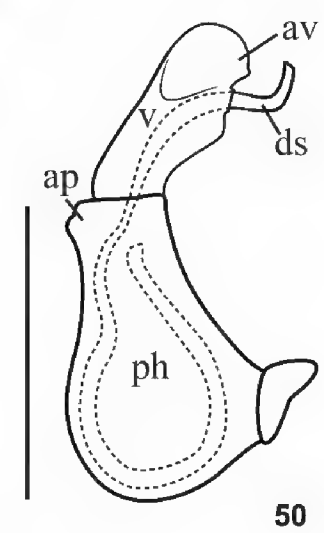

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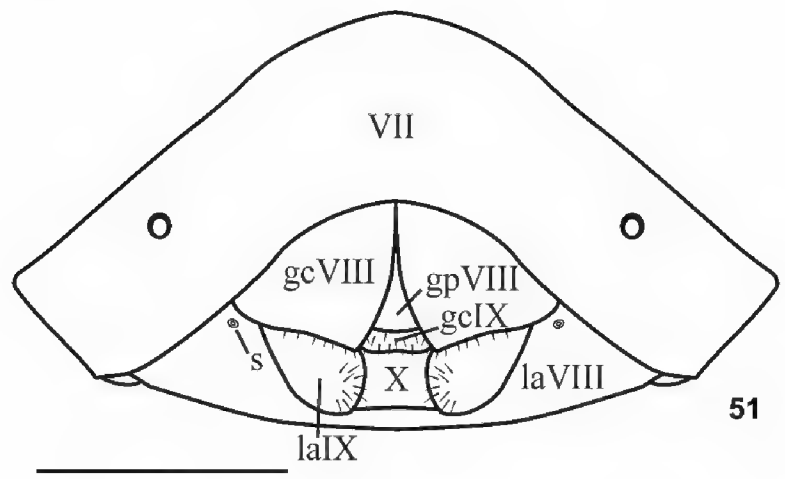

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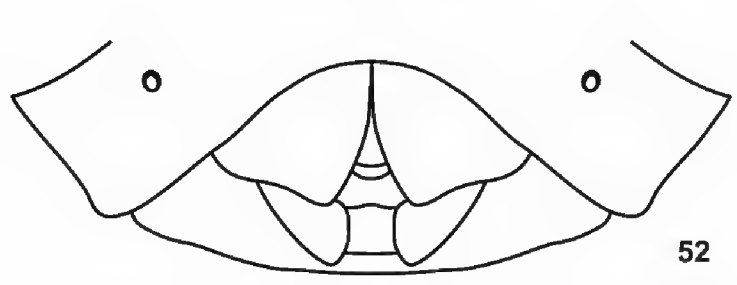
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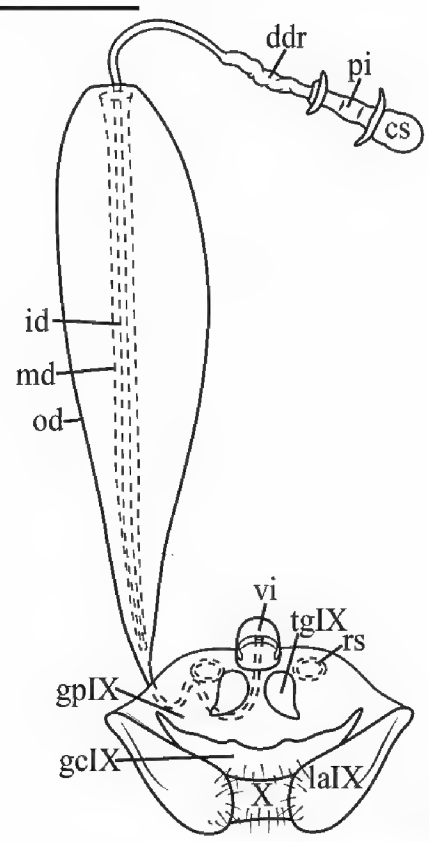

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Figures 45–53. *Lineostethus sinuosus* sp. nov.: (45–47) male pygophore, dorsal, ventral and posterior views respectively; (48–49) left paramere, dorsal and lateral views; (50) phallus, lateral view; (51–52) female genital plates; (53) female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 45–49, 51–52 = 1 mm; 50, 53 = 0.5 mm.

sutural angles are exclusive to *L. sinuosus* sp. nov. The shape of the thickening of the gonapophyses VIII is also exclusive inside the genus, and along with the helicoid distal ductus receptaculi is diagnostic to the species.

Description. Antennae ivory; segments II–III with longitudinal brown lines. Anterolateral margins of pronotum and proximal portion of lateral margin of corium punctured in some specimens. Unpunctured area laterad to the apex of radial vein of coria smaller to subequal to the width of one eye. Hemelytral membrane at least reaching the apex of abdomen, with 6 veins. Ventrally, punctures sparse and laterally concentrated. Femora with brown circular spots on distal half.

Male genitalia. Foliaceous expansions of dorsal rim subrectangular; apex of expansions at least reaching the posterior limit of ventral rim; posterolateral angles visible dorsally (Fig. 45: fdr, pa). Basal impression of the foliaceous expansions subrectilinear; cutting of dorsal rim U-shaped (Fig. 45: bi, dr). Posterolateral angles rounded, apex obtuse, sometimes with setae on posterior margin (Figs 45–46: pa). Segment X visible on the cutting of dorsal rim (Fig. 45: dr, X). Margin of the superior layer of ventral rim sinuous, median excavation U-shaped (Fig. 46: vr). Margin of the inferior layer of ventral rim with one arc of short bristles (Figs 46–47: b). Projections of the superior layer of ventral rim spatulate at apex, forming a right angle with the posterolateral angles; dorsal margin convex and ventral margin sinuous, median third enlarged in relation to the lateral thirds; setae on the posterior margin of the projections (Fig. 47: psl). Parameres sinuous, parallel to segment X, apex reaching the mesial margin of the foliaceous expansions of the dorsal rim; head lozenge (Figs 47–49: par, X, dr). Ventral surface of phallotheca subrectilinear (Fig. 50: ph, ap). Vesica obtuse and more sclerotized at apex; apical margin concave, extending to basal 1/3 of ductus seminis distalis (Fig. 50: v, av, ds). Distal portion of the ductus seminis distalis about 2/3 of vesica length, narrowing posteriorly (Fig. 50: ds).

Female genitalia. Posterior margin of urosternite VII concave (Figs 51–52: VII). Gonocoxites VIII subtriangular; sutural margins diverging towards apex, sutural angles posteriorly projected; posterior margin sinuous, varying in intensity (Figs 51–52: gcVIII) with the sinuosity of the posterior margins, sometimes with lateral angles partially hiding the spiracles of the laterotergites VIII, and sutural angles projected over the base of the laterotergites IX, or not. Posterior margin of laterotergites VIII convex; limit between laterotergites VIII and tergite VIII indistinguishable (Figs 51–52: la8). Posterior margin of gonocoxites IX subrectilinear (Fig. 51: gcIX) to convex (Fig. 52: gcIX). Gonapophyses VIII visible and smooth (Figs 51–52: gpVIII). Laterotergites IX digitiform, with a median depression; varying in shape from lateral margins convex with apex rounded to lateral margins subrectilinear with apex acute (Figs 51–52: la9). Posterior margin of segment X subrectilinear (Figs 51–52: X). Thickening of gonapophyses IX sinuous, surpassing the lateral margin of the thickening of vaginal intima (Fig. 53: gpIX, tgIX). Thickening of vaginal intima subtriangular, flat (Fig. 53: vi). Distal portion of ductus receptaculi helicoid (Fig. 53: ddr); anterior annular crest turned to ductus receptaculi; pars intermedialis subequal in length to capsula seminalis; posterior annular crest turned to pars intermedialis (Fig. 53: pi, cs).

Measurements. Male (n = 5): head length, 1.54 ± 0,07 (1.48–1.63); width, 2.98 ± 0.13 (2.79–3.16); length of antennal segments: I, 0.42 ± 0.03 (0.38–0.44); II, 0.68 ± 0.02 (0.66–0.70); III, 0.69 ± 0.08 (0.62–0.78); IV, 0.80; V, 0.96; length of labial segments: I, 0.67 ± 0.06 (0.62–0.76); II, 1.50 ± 0.05 (1.44–1.56); III, 0.61 ± 0.04 (0.56–0.68); IV, 0.48 ± 0.07 (0.42–0.60); pronotum length, 1.75 ± 0.09 (1.64–1.84); width, 4.00 ± 0.16 (3.76–4.15); scutellum length, 3.38 ± 0.21 (3.07–3.64); width, 2.66 ± 0.12 (2.48–2.82); total length, 6.43 ± 0.31 (6.11–6.82); abdominal width, 4.45 ± 0.22 (4.20–4.70).

Female (n = 5): head length, 1.49 ± 0.10 (1.32–1.58); width, 2.99 ± 0.20 (2.67–3.20); length of antennal segments: I, 0.40 ± 0.02 (0.38–0.42); II, 0.73 ± 0.10 (0.62–0.82); III, 0.64 ± 0.06 (0.54–0.70); IV, 0.81 ± 0.09 (0.70–0.90); V, 0.98 ± 0.07 (0.88–1.04); length of labial segments: I, 0.68 ± 0.10 (0.58–0.78); II, 1.44 ± 0.10 (1.30–1.52); III, 0.64 ± 0.07 (0.56–0.70); IV, 0.47 ± 0.04 (0.44–0.52); pronotum length, 1.76 ± 0.09 (1.60–1.82); width, 4.05 ± 0.26 (3.64–4.25); scutellum length, 3.35 ± 0.13 (3.13–3.48); width, 2.63 ± 0.12 (2.45–2.79); total length, 6.68 ± 0.37 (6.04–7.03); abdominal width, 4.44 ± 0.31 (3.92–4.75).

Type material. Holotype (male): MEXICO, *Yucatán*: Puerto Chicxulub (Convolvulaceae), 25-XI-2011, Jean-Luc Dzido leg. (deposited in: DZUP). Paratypes: MEXICO, *Yucatán*: (12 km N Quintana Roo, Hwy 295), 1 male and 2 females, 20-V-1987, D.A. Rider E.G. & T.J. Riley leg. (DARC); Chichen-Itza, 1 female, 16-VII-1952, J. & D. Pallister leg. (AMNH); *Quintana Roo:* Chichén-Itzá, 2 males, 10-VIII-1990, D.A. Rider leg. (1 male UFRG and 1 male DARC); Coba, 1 male, 11-VIII-1990, D.A. Rider leg. (DARC); (45 mi W Chetumal), 3 females, 9-VIII-1974, C.W. & L.O'Brien & Marshall leg. (1 female UFRG and 2 females DARC). BELIZE: (H?25), 1 male, no date (CAS); (Belize Mile 36 Northern Road), 1 male and 1 female, 11-VIII-1977, C.W. & L. O'Brien & Marshall leg. (AMNH). HONDURAS, *Cortes*: (5 km N Cofradia), 1 male, 5-VIII-1977, C.W. & L.B. O'Brien & Marshall leg. (AMNH).

Distribution (Fig. 78). Mexico: *Yucatán*, *Quintana Roo*; Belize; Honduras: *Cortes*.

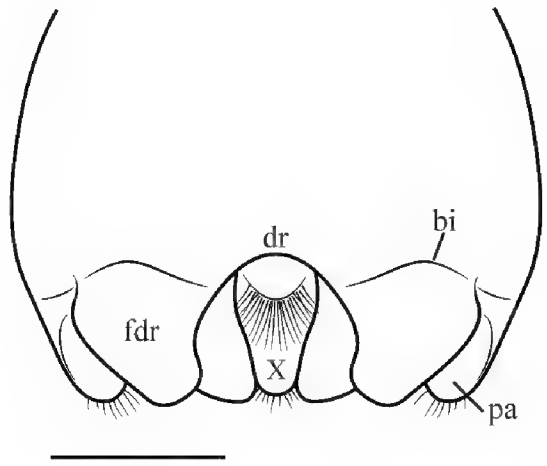
Etymology. The epithet refers to the shape of the females' gonocoxites VIII; Latin adjective masculine, *sinuosus (-a, -um)* = full of bendings, windings.

Remarks. From the data retrieved of specimens' labels, Convolvulaceae are possible host plants.

Lineostethus acuminatus Kochenborger & Garbelotto, sp. nov.

http://zoobank.org/3E36196F-22D0-4FC2-8486-8E2BCCDCC36D
Figs 6, 54–61, 78

Diagnosis. Males of *L. acuminatus* sp. nov. differ from most species by the subtriangular expansions of the dorsal rim,



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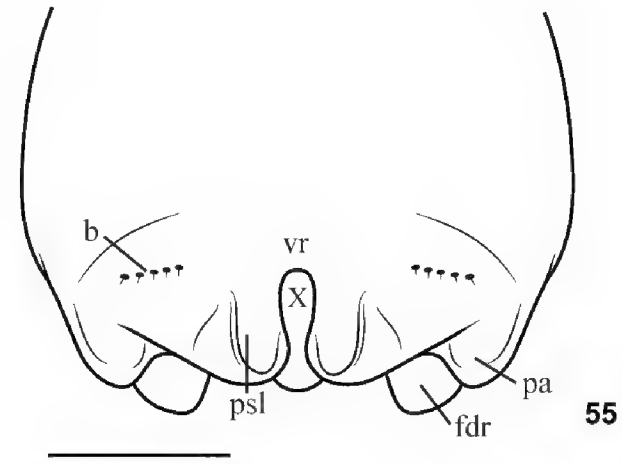

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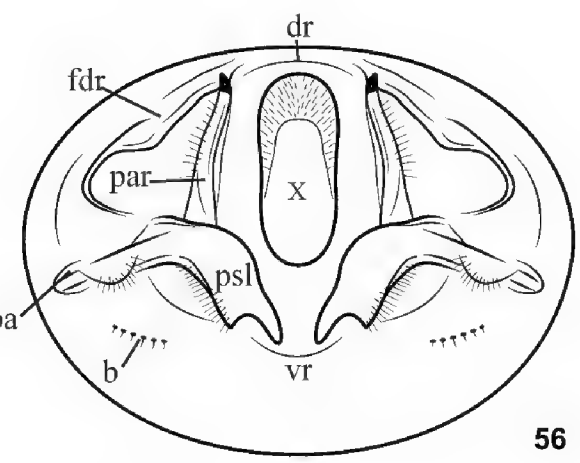

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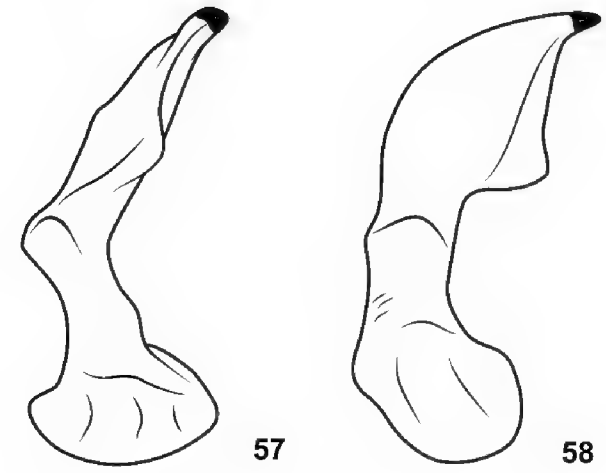
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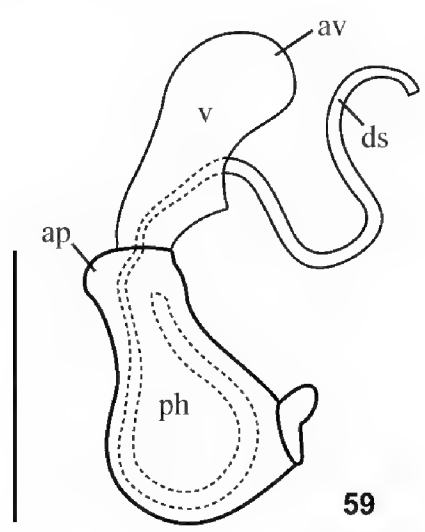

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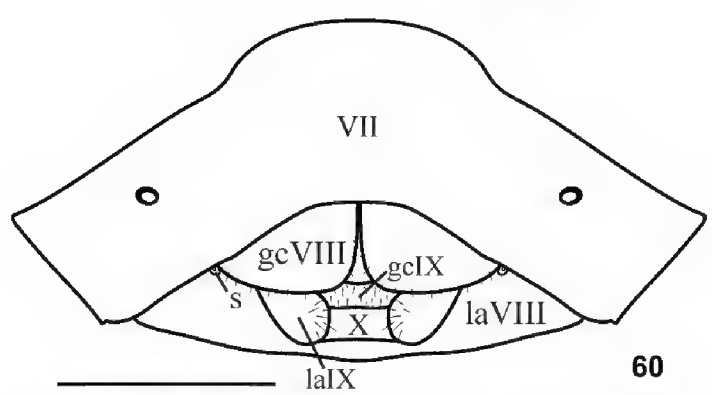

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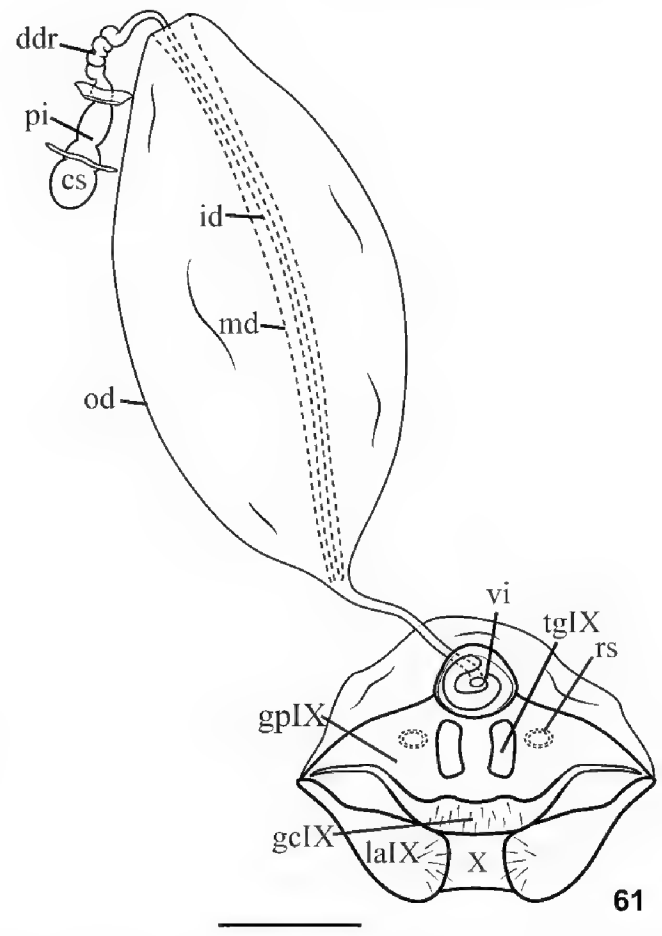

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Figures 54–61. *Lineostethus acuminatus* sp. nov.: (54–56) male pygophore, dorsal, ventral and posterior views respectively; (57–58) left paramere, dorsal and lateral views; (59) phallus, lateral view; (60) female genital plates; (61) female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 54–58, 60 = 1 mm; 59, 61 = 0.5 mm.

although resembling *L. graziae*. *L. acuminatus* sp. nov. expansions are longer and narrower than *L. graziae* (Figs 37, 54: fdr), and the dorsal rim cutting is U-shaped in *L. acuminatus* sp. nov. while subquadrangular in *L. graziae* (Figs 37, 54: dr). Also, the projections of the superior layer of the ventral rim in *L. acuminatus* sp. nov. are uniformly wide and the apex is hook-shaped (Fig. 55: psl). The phallus of *L. acuminatus* sp. nov. bears the largest vesica and the longest ductus seminis distalis in the genus (Fig. 59: v, ds). The females of the new species are recognized by the truncated apex of laterotergites IX and the posterior margin of segment X concave to subrectilinear (Fig. 60: la9, X); the circular thickening of vaginal intima, the ductus receptaculi distal helicoid, and the pars intermedialis with an apical constriction help to identify this species (Fig. 61: vi, ddr, pi).

Description. Antennae ivory; segments II–III with longitudinal brown lines. Anterolateral margins of pronotum and proximal portion of lateral margin of corium punctured in some specimens. Scutellum may present a spot of brown punctures on disc and on post-frenal lobe. Unpunctured area laterad to the apex of radial vein of coria smaller than the width of one eye. Hemelytral membrane reaching the apex of abdomen, with 6–7 veins. Ventrally, punctures sparse and laterally concentrated. Femora with sparse brown circular spots on distal half.

Male genitalia. Foliaceous expansions of dorsal rim subtriangular; apex of expansions rounded and surpassing the posterior limit of ventral rim; posterolateral angles visible dorsally (Fig. 54: fdr, pa). Basal impression of the foliaceous expansions sinuous, cutting of dorsal rim U-shaped (Fig. 54: bi, dr). Posterolateral angles rounded (Figs 55–56: pa). Margin of the superior layer of ventral rim sinuous, median excavation drop-shaped (Fig. 55: vr). Margin of the inferior layer of ventral rim with one subrectilinear line of short bristles (Figs 55–56: b). Segment X with a line of setae on base (Figs 54–55: X). Projections of the superior layer of ventral rim forming a right angle with posterolateral angles, covered by setae; dorsal margin convex and ventral margin concave; narrow at base, apex acute and hook-shaped, median third uniformly enlarged towards the apex (Fig. 56: psl, pa). Parameres parallel or slightly directed to segment X, reaching the foliaceous expansions of dorsal rim; head lozenge (Figs 56–58: par, X, fdr). Ventral surface of phallotheca concave (Fig. 59: ph, ap). Vesica apex rounded; apical margin concave extending to mid of ductus seminis distalis (Fig. 59: v, av, ds). Distal portion of ductus seminis distalis sinuous, about 2/3 longer than vesica, narrowing posteriorly (Fig. 59: ds).

Female genitalia. Posterior margin of urosternite VII concave (Fig. 60: VII). Gonocoxites VIII subtriangular; sutural and posterior margins subrectilinear (Fig. 60: gcVIII). Posterior margin of laterotergites VIII slightly convex; limit between laterotergites VIII and tergite VIII indistinguishable (Fig. 60: la8). Posterior margin of gonocoxites IX subrectilinear (Fig. 60: gcIX). Laterotergites IX digitiform and truncate apex; mesial and lateral margins convex (Fig. 60: la9). Posterior margin of segment X concave to rectilinear (Fig. 60: X). Thickening of gonapophyses IX subrectangular, not surpassing the lateral margin of the thickening of vaginal intima (Fig. 61: gpIX, tgIX). Thickening of vaginal intima circular and flat (Fig. 61: vi). Distal portion of ductus receptaculi helicoid (Fig. 61: ddr); anterior annular crest turned to ductus receptaculi; pars intermedialis with a shallow constriction on its apex and subequal in length to capsula seminalis; posterior annular crest perpendicular to pars intermedialis (Fig. 61: pi, cs). Capsula seminalis shallowly constricted near base (Fig. 61: cs).

Measurements. Male (n = 5): head length, 1.54 ± 0.07 (1.43–1.63); width, 2.96 ± 0.16 (2.70–3.10); length of antennal segments: I, 0.40 ± 0.01 (0.40–0.42); II, 0.68 ± 0.04 (0.62–0.70); III, 0.67 ± 0.06 (0.60–0.74); IV, 0.89 ± 0.01 (0.88–0.90); V, 1.05 ± 0.07 (1.00–1.10); length of labial segments: I, 0.66 ± 0.05 (0.60–0.70); II, 1.34 ± 0.05 (1.30–1.40); III, 0.63 ± 0.05 (0.58–0.70); IV, 0.46 ± 0.05 (0.38–0.50); pronotum length, 1.66 ± 0.11 (1.52–1.80); width, 3.95 ± 0.18 (3.65–4.10); scutellum length, 3.30 ± 0.15 (3.08–3.48); width, 2.61 ± 0.12 (2.42–2.73); total length, 6.26 ± 0.30 (6.32–6.53); abdominal width, 4.28 ± 0.19 (4.00–4.45).

Female (n = 5): head length, 1.55 ± 0.06 (1.45–1.63); width, 3.09 ± 0.13 (2.95–3.24); length of antennal segments: I, 0.42 ± 0.02 (0.40–0.46); II, 0.71 ± 0.06 (0.64–0.78); III, 0.65 ± 0.04 (0.60–0.70); IV, 0.81 ± 0.07 (0.74–0.90); V, 0.96 ± 0.03 (0.94–1.00); length of labial segments: I, 0.67 ± 0.04 (0.60–0.70); II, 1.39 ± 0.08 (1.26–1.48); III, 0.65 ± 0.09 (0.60–0.80); IV, 0.43 ± 0.04 (0.40–0.48); pronotum length, 1.76 ± 0.08 (1.62–1.82); width, 4.07 ± 0.13 (3.88–4.20); scutellum length, 3.36 ± 0.08 (3.28–3.44); width, 2.68 ± 0.10 (2.64–2.79); total length, 6.67 ± 0.19 (6.60–6.96); abdominal width, 4.52 ± 0.14 (4.30–4.65).

Type material. Holotype (male): COSTA RICA, *Guanacaste*: Santa Rosa (NP, Research Station 308.1, 10.81N 85.62W), 7-XII-2008, Weirauch & Forero leg. (deposited in: DZUP). Paratypes: HONDURAS: *El Paraiso*: Zamorano, 1 male, 28-VII-1977, O'Brien leg. (DARC). COSTA RICA: (C.a. E.P.), 1 male, no date (CAS); *Guanacaste*: Las Cañas (Finca La Taboga), 1 female, 17-27-VI-1969, Toby Schuh, Janet Crane leg. (AMNH); Santa Rosa (NP, Research Station, 308m, 10.84°N 85.62°W), 2 males and 4 females, 06-XII-2008, Weirauch & Forero leg. (UCRC); Palo Verde National Park (Nr OTS research station 26m, 10.35°N 85.35°W), 3 males and 8 females, 4-XII-2008, Weirauch & Forero leg. (UFRG). PANAMA, *Los Santos*: Taboga, 1 male, XII-1953, Collector: N.L.H. Kraus leg. (AMNH).

Distribution (Fig. 78). Honduras: *El Paraiso*; Costa Rica: *Guanacaste*; Panama: *Los Santos*.

Etymology. The epithet refers to the shape of the apex of each projection of the superior layer of ventral rim of pygophore; Latin adjective masculine, *acuminatus* (*-a*, *-um*) = pointed, sharpened.

Lineostethus otarus Garbelotto & Kochenborger, sp. nov.

http://zoobank.org/D6A205DB-7ECB-4C93-B813-2515E45876AA
Figs 7, 62–69, 78

Diagnosis. *Lineostethus otarus* sp. nov. and *L. auritus* sp. nov. share similar features in both male and female genitalia: the long foliaceous expansions of the dorsal rim of pygophore; two lines of bristles on the ventral wall, one of them not associated with punctures; and broad gonocoxites VIII. *Lineostethus otarus* sp. nov. is distinguished by the wider foliaceous expansions of the dorsal rim, hiding the posterolateral angles of pygophore; the sinuous proximal portion of the lateral margin of the expansions; and the projections of the superior layer of ventral rim more elongated. Females of *L. otarus* sp. nov. are distinguished by the posterior margin of urosternite VII subrectilinear over laterotergites IX, and the sinuous posterior margin of gonocoxites VIII.

Description. General color of the specimens with some variation, in melanic specimens margins of connexival segments with lines of black punctures more evident. Antennae ivory; segments II–III with longitudinal brown lines dorsally and ventrally; segments IV–V usually darker than the previous. Anterolateral margins of pronotum and proximal portion of lateral margin of corium punctured. Anterior margin of scutellum with two to four brown spots, and one ivory spot medially; post-frenal lobe with 1+1 lateral brown maculae. Unpunctured area laterad to the apex of radial vein of coria inconspicuous to equivalent to the width of one eye. Hemelytral membrane at least reaching apex of abdomen, with 6 veins. Ventrally, punctures uniformly distributed, absent on sterna. Femora with sparse brown circular spots on distal half.

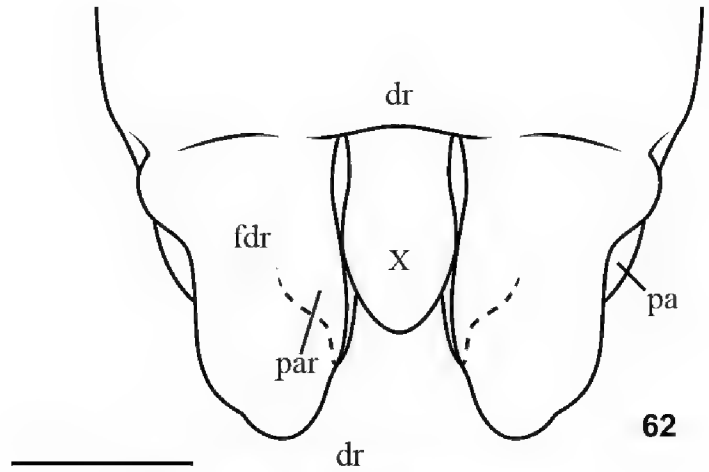
Male genitalia. Foliaceous expansions of dorsal rim subrectangular, elongated, longer than wide, narrowing towards the apex; proximal portion of the lateral margin of expansions sinuous; apex rounded, surpassing the posterior limit of ventral rim by half of the expansion length, and visible dorsally when fixed at the specimen (Fig. 62: fdr). Basal impression of the foliaceous expansions subrectilinear, cutting of dorsal rim subrectangular (Fig. 62: bi, dr). Posterolateral angles acute and dorsally hidden by the dorsal rim expansions, covered by setae (Figs 62–63: pa). Margin of the superior layer of ventral rim V-shaped, median excavation drop-shaped (Fig. 63: vr). Margin of the inferior layer of ventral rim with two lines of short bristles: one posterior, subrectilinear and not associated with punctures; and another anterior, concave and associated with punctures (Figs 63–64: b). Segment X with a line of setae on middle (Fig. 62: X). Projections of the superior layer of ventral rim forming a right angle with the posterolateral angles, covered by setae; dorsal margin convex and ventral margin subrectlinear, elongated and uniformly wide throughout its length, apex acute and hook-shaped (Fig. 64: psl, pa). Parameres parallel to segment X, at least reaching the foliaceous expansions of dorsal rim; head lozenge (Figs 64–66: par, X, fdr). Ventral surface of phallotheca concave (Fig. 67: ph, ap). Vesica apex subquadrangular; apical margin with a sclerotized contour, subrectilinear, and surpassing ductus seminis distalis (Fig. 67: v, av, ds). Distal portion of ductus seminis distalis placed in a concavity on the middle of vesical, short and bending down (Fig. 67: ds).

Female genitalia. Posterior margin of urosternite VII sinuous, middle third subrectilinear and lateral thirds convex (Fig. 68: VII). Gonocoxites VIII subquadrangular, broad; posterior margin slightly sinuous, subrectilinear over laterotergites IX, with external angles truncated and weakly projecting over laterotergites VIII (Fig. 68: gcVIII). Posterior margin of laterotergites VIII subrectilinear; limit between laterotergites VIII and tergite VIII indistinguishable (Fig. 68: la8). Posterior margin of gonocoxites IX subrectilinear to convex (Fig. 68: gcIX). Laterotergites IX digitiform, tumescent at apex; apex varying between rounded and slightly acute (Fig. 68: la9). Posterior margin of segment X subrectilinear (Fig. 68: X). Thickening of gonapophyses IX kidney-shaped, surpassing the lateral margin of the thickening of vaginal intima (Fig. 69: gpIX, tgIX). Thickening of vaginal intima subquadrangular (Fig. 69: vi). Distal portion of ductus receptaculi apically enlarged and more sclerotized (Fig. 69: ddr); anterior annular crest turned to ductus receptaculi; pars intermedialis membranous at apex, longer than capsula seminalis; posterior annular crest perpendicular to pars intermedialis (Fig. 69: pi, cs). Capsula seminalis shallowly constricted near base (Fig. 69: cs).

Measurements. Male (n = 5): head length, 1.75 ± 0.06 (1.68–1.82); width, 3.13 ± 0.06 (3.04–3.20); length of antennal segments: I, 0.48 ± 0.02 (0.46–0.50); II, 0.73 ± 0.03 (0.70–0.78); III, 0.80 ± 0.01 (0.80–0.82); IV, 0.97 ± 0.09 (0.90–1.10); V, 1.06 ± 0.07 (0.98–1.12); length of labial segments: I, 0.76 ± 0.04 (0.72–0.80); II, 1.63 ± 0.11 (1.52–1.82); III, 0.72 ± 0.07 (0.66–0.84); IV, 0.53 ± 0.02 (0.50–0.54); pronotum length, 1.79 ± 0.07 (1.78–1.86); width, 4.41 ± 0.33 (4.20–4.98); scutellum length, 3.46 ± 0.15 (3.28–3.68); width, 2.74 ± 0.07 (2.67–2.84); total length, 8.16 ± 0.25 (7.80–8.40); abdominal width, 4.82 ± 0.10 (4.70–4.95).

Female (n = 5): head length, 1.81 ± 0.08 (1.72–1.92); width, 3.22 ± 0.11 (3.10–3.36); length of antennal segments: I, 0.49 ± 0.02 (0.48–0.52); II, 0.77 ± 0.05 (0.70–0.80); III, 0.82 ± 0.09 (0.72–0.92); IV, 0.97 ± 0.05 (0.92–1.02); V, 1.16 ± 0.04 (1.10–1.12); length of labial segments: I, 0.77 ± 0.10 (0.60–0.86); II, 1.40 ± 0.45 (0.60–1.70); III, 0.71 ± 0.08 (0.62–0.84); IV, 0.52 ± 0.04 (0.46–0.56); pronotum length, 1.82 ± 0.09 (1.82–1.94); width, 4.35 ± 0.21 (4.10–4.68); scutellum length, 3.54 ± 0.18 (3.28–3.68); width, 2.86 ± 0.14 (2.70–3.07); total length, 8.58 ± 0.30 (8.20–9.00); abdominal width, 4.94 ± 0.30 (4.55–5.36).

Type material. Holotype (male): MEXICO, *Michoacán*: (Hwy. 15, 21 mi E Morelia, 7000'), 15-VIII-1982, C.W. & L.O'Brien & G.Wibmer leg. (AMNH). Paratypes: MEXICO,



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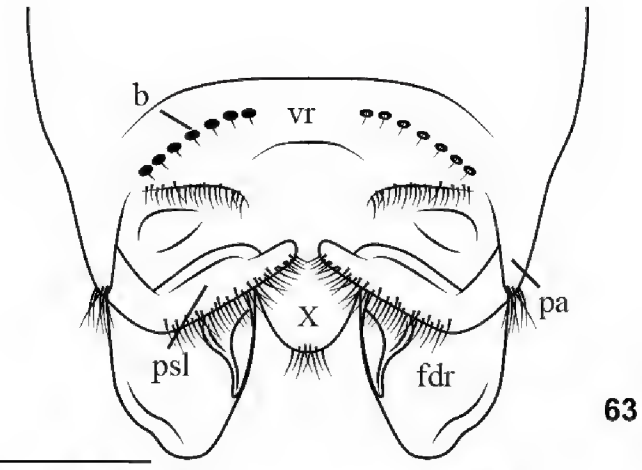

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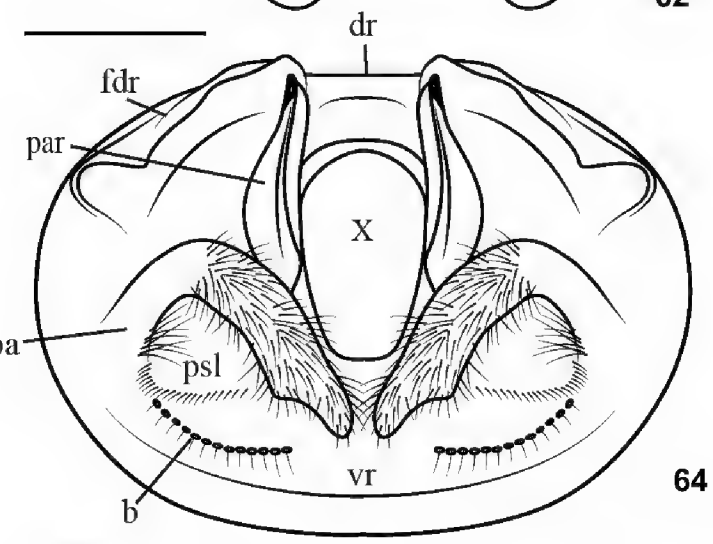

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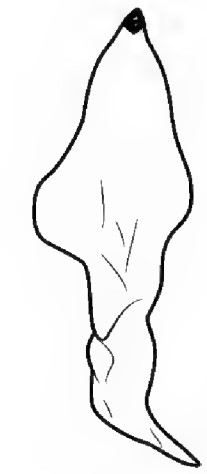

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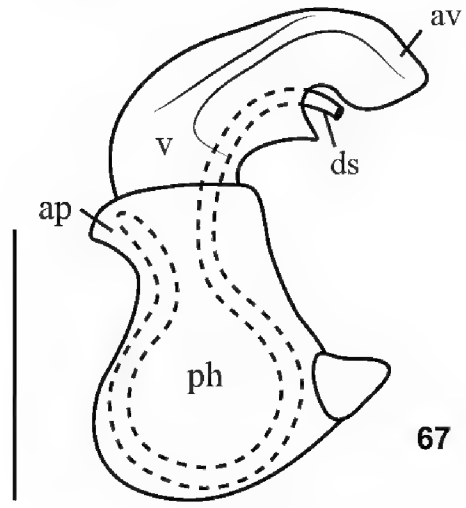

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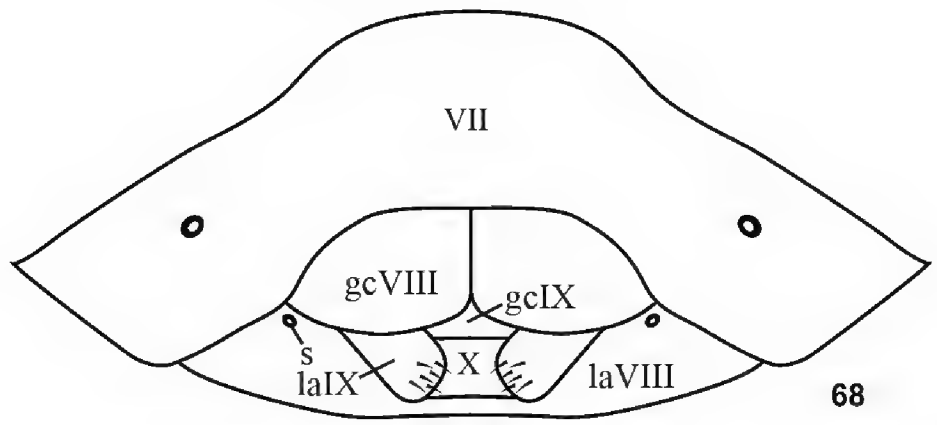

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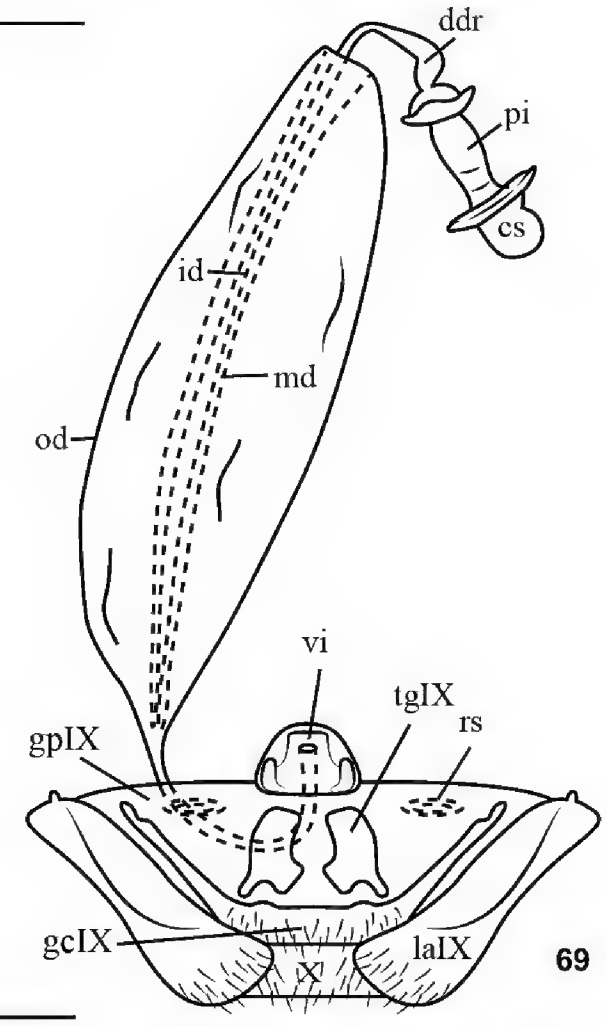

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Figures 62–69. *Lineostethus otarus* sp. nov.: (62–64) male pygophore, dorsal, ventral and posterior views respectively; (65–66) left paramere, dorsal and lateral views; (67) phallus, lateral view; 68, female genital plates; (69) female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 62–66, 68 = 1 mm; 67, 69 = 0.5 mm.

Michoacán: (Hwy 15,21 mi E Morelia, 7000'), 8 males and 13 females, 15-VIII-1982, C.W. & L.O'Brien & G.B. Marshall leg. (1 male UFRG; 1 female AMNH; 7 males and 12 females DARC); *Puebla*: (Hwy 18 mi NW Azumbilla, 7700'), 1 female, 14-V-1983, 1100', C.W. & L.O'Brien & G.B. Marshall leg. (UFRG).

Distribution (Fig. 78). México: *Michoacán*, *Puebla* (Fig. 78).

Etymology. The epithet refers to the shape of the foliaceous expansions of dorsal rim of pygophore; adjective *otarus* (*-a*, *-um*), latinized from Greek *otaros* = large-eared.

Lineostethus auritus Garbelotto & Kochenborger, sp. nov.

http://zoobank.org/2715A9D8-BB2E-4DA3-81DE-1988FAB542C9
Figs 8, 70–78

Diagnosis. Males of *L. auritus* sp. nov. are distinguished by the long and narrow foliaceous expansions of dorsal rim truncate at apex, leaving the posterolateral angles of pygophore visible dorsally. The females have broad gonocoxites VIII with the posterior margin uniformly convex; the shape of the thickening of the gonapophyses IX and of the thickening of vaginal intima are also diagnostic.

Description. Antennae usually brown, with lateral lines ivory, sometimes antennae variegated. Anterolateral margins of pronotum and proximal portion of lateral margin of corium punctured. Anterior margin of scutellum with two to four brown spots, and at least one ivory spot medially; post-frenal lobe sometimes with lateral brown maculae. Connexival segments with lines of black punctures on anterior and posterior margin of each segment. Unpunctured area laterad to the apex of radial vein of coria at least equivalent to half of eye width. Hemelytral membrane slightly surpassing the apex of abdomen, with 9 veins. Ventrally, punctures concentrated on lateral margins of abdomen. Femora with sparse brown circular spots on distal half.

Male genitalia. Foliaceous expansions of dorsal rim subrectangular, elongated, longer than wide; lateral margins of expansions slightly concave; apex truncate, slightly wider than the median width, surpassing the posterior limit of ventral rim by half of the expansion length; not hiding the posterolateral angles (Fig. 70: fdr, pa). Basal impression of the foliaceous expansions sinuous, cutting of dorsal rim subrectangular (Fig. 70: bi, dr). Posterolateral angles acute, ventrally covered by setae (Figs 70–71: pa). Margin of the superior layer of ventral rim open V-shaped, median excavation drop-shaped (Fig. 71: vr). Margin of the inferior layer of ventral rim with two lines of short bristles: one posterior, subrectilinear and not associated with punctures; and another anterior, concave and associated with punctures (Figs 71–72: b). Segment X with dorsal setae on apex (Fig. 70: X). Projections of the superior layer of ventral rim forming a right angle with the posterolateral angles, covered by setae; dorsal and ventral margins subrectilinear, apex spatulate (Fig. 72: psl, pa). Parameres parallel to segment X, surpassing the foliaceous expansions of dorsal rim; head subtriangular (Figs 72–74: par, X, fdr). Ventral surface of phallotheca concave (Fig. 75: ph, ap). Vesica apex rounded; apical margin convex, extending to mid of ductus seminis distalis (Fig. 75: v, av, ds). Distal portion of ductus seminis distalis subequal to vesica in length (Fig. 75: ds).

Female genitalia. Posterior margin of urosternite VII uniformly concave (Fig. 76: VII). Gonocoxites VIII subquadrangular, broad; posterior margin uniformly convex (Fig. 76: gcVIII). Posterior margin of laterotergites VIII subrectilinear; limit between laterotergites VII and tergite VIII indistinguishable (Fig. 76: la8). Gonocoxites IX small, posterior margin subrectilinear (Fig. 76: gcIX). Laterotergites IX digitiform, tumescent and rounded at apex (Fig. 76: la9). Posterior margin of segment X concave (Fig. 76: X). Thickening of gonapophyses IX subcilindrical slightly expanded on base, surpassing the lateral margin of the thickening of vaginal intima (Fig. 77: gpIX, tgIX). Thickening of vaginal intima subtriangular (Fig. 77: vi). Distal portion of ductus receptaculi apically enlarged and more sclerotized (Fig. 77: ddr); anterior and posterior annular crests perpendicular to pars intermedialis; pars intermedialis membranous at apex, subequal to capsula seminalis (Fig. 77: pi, cs). Capsula seminalis shallowly constricted near base (Fig. 77: cs).

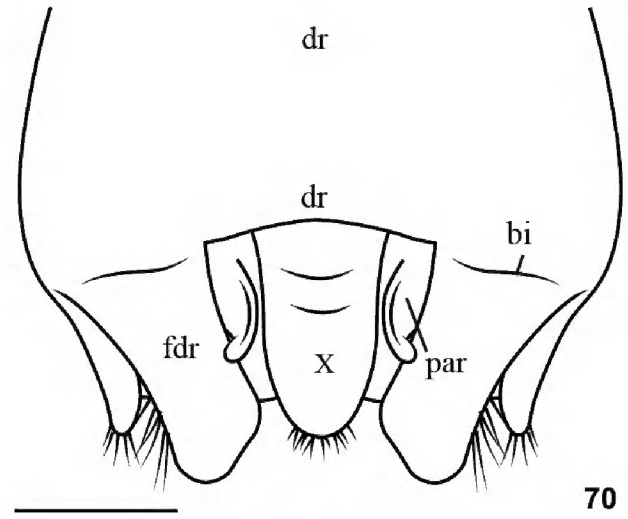
Measurements. Male (n = 2): head length, 1.78 ± 0.25 (1.60–1.96); width, 3.13 ± 0.21 (2.98–3.28); length of antennal segments: I, 0.46 ± 0.06 (0.42–0.50); II, 0.74; III, 0.52; IV, 0.78; V, 1.00; length of labial segments: I, 0.71 ± 0.10 (0.64–0.78); II, 1.50 ± 0.14 (1.40–1.60); III, 0.70 ± 0.03 (0.68–0.72); IV, 0.49 ± 0.07 (0.44–0.54); pronotum length, 1.8 ± 0.20 (1.66–1.94); width, 4.11 ± 0.43 (3.80–4.41); scutellum length, 3.38 ± 0.31 (3.16–3.60); width, 2.71 ± 0.29 (2.50–2.91); total length, 7.72 ± 1.68 (6.53–8.90); abdominal width, 4.53 ± 0.53 (4.15–4.90).

Female (n = 2): head length, 1.95 ± 0.04 (1.92–1.98); width, 3.49 ± 0.07 (3.44–3.54); length of antennal segments: I, 0.67 ± 0.18 (0.54–0.8); II, 0.89 ± 0.16 (0.78–1.00); III, 0.53 ± 0.04 (0.50–0.56); IV, 1.05 ± 0.04 (1.02–1.08); V, 1.25 ± 0.07 (1.20–1.30); length of labial segments: I, 0.74 ± 0.08 (0.68–0.80); II, 1.62 ± 0.03 (1.60–1.64); III, 0.77 ± 0.10 (0.70–0.84); IV, 0.54 ± 0.04 (0.51–0.56); pronotum length, 2.03 ± 0.07 (1.98–2.08); width, 4.78 ± 0.11 (4.70–4.85); scutellum length, 3.88 ± 0.11 (3.08–3.95); width, 2.92 ± 0.09 (2.85–2.98); total length, 9.40; abdominal width, 5.36.

Type material. Holotype (male): MEXICO, *Oaxaca*: (9 mi N Oaxaca), 31-V-1983, C.W. & L.O'Brien & Marshall leg. (deposited in: AMNH). Paratypes: MEXICO, *Oaxaca*: (5mi S Candelaria Loxicha), 1 male, 18-19-VII-1974, Clar Marray Ashe & Shaffner leg. (DARC); (9mi N Oaxaca), 2 females, 31-V-1983, C.W. & L.O'Brien & Marshall leg. (1 female AMNH; 1 female DARC).

Distribution (Fig. 78). Mexico: *Oaxaca*.

Etymology. The epithet refers to the shape of the foliaceous expansions of dorsal rim of pygophore; Latin adjective, *auritus* (*-a*, *-um*) = eared.



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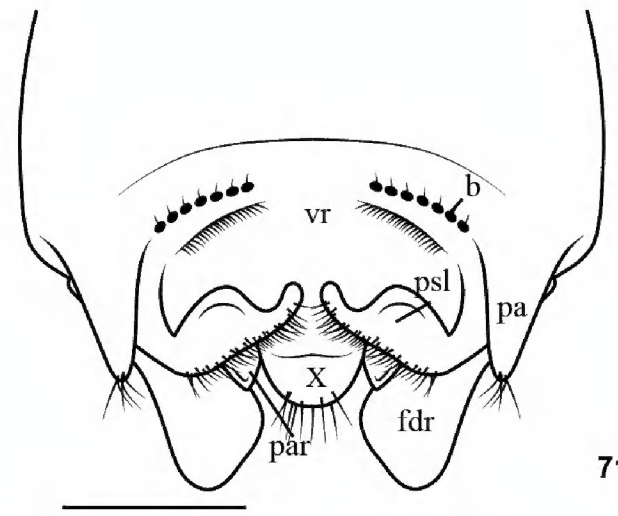

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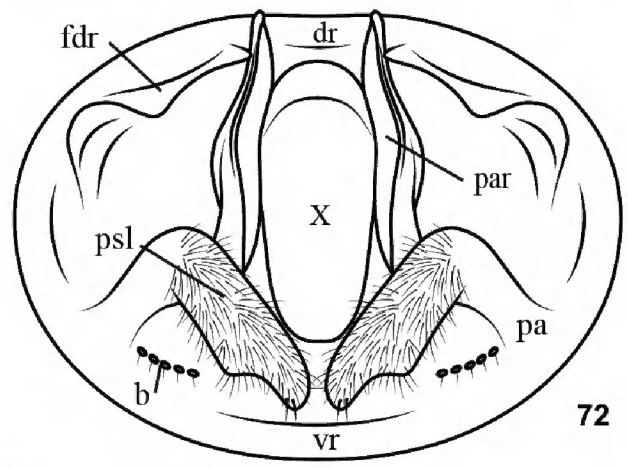

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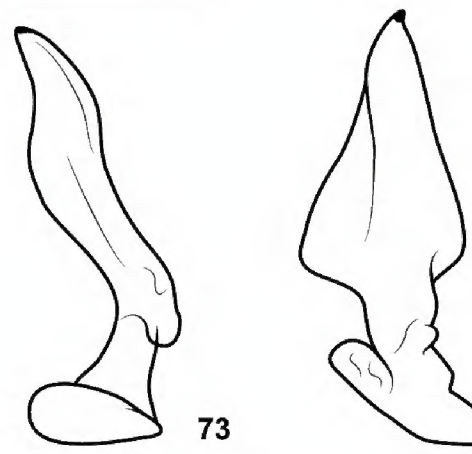

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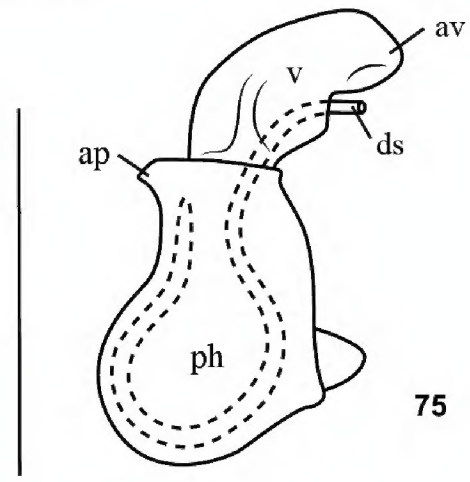

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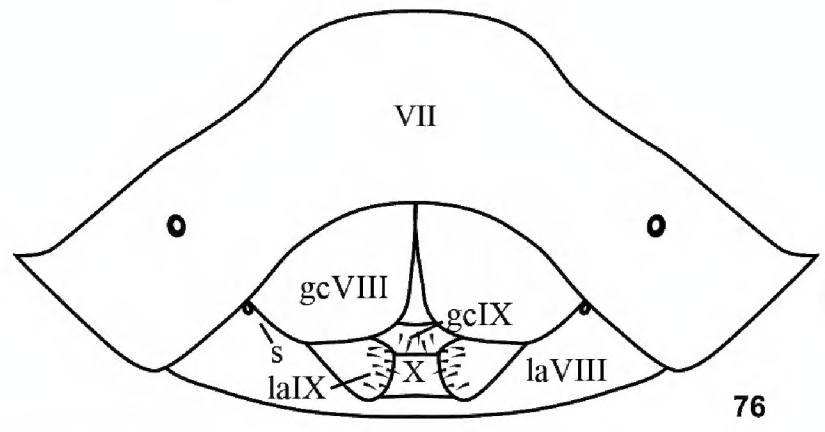

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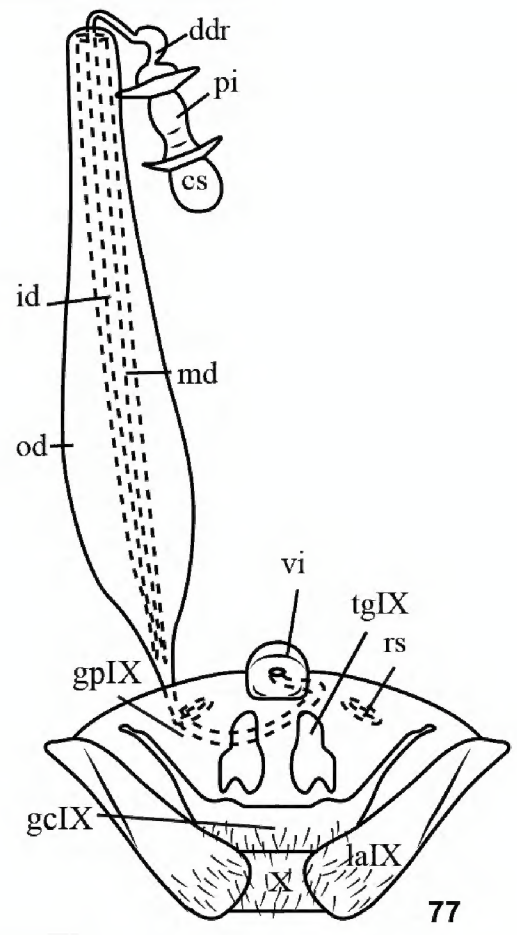

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Figures 70–77. *Lineostethus auritus* sp. nov.: (70–72) male pygophore, dorsal, ventral and posterior views respectively; (73–74) left paramere, dorsal and lateral views; (75) phallus, lateral view; (76) female genital plates; (77) female receptaculum seminis. Abbreviations: ap, ventral apical projection of phallotheca; av, apical margin of vesica; b, bristles; bi, basal impression of foliaceous expansions; cs, capsula seminalis; ddr, distal ductus receptaculi; dr, dorsal rim; ds, ductus seminis distalis; fdr, foliaceous expansions of dorsal rim; gcVIII, gonocoxites VIII; gcIX, gonocoxites IX; gpVIII, gonapophyses VIII; gpIX, gonapophyses IX; id, internal duct of vesicular area; la8, laterotergites VIII; la9, laterotergites IX; md, median duct of vesicular area; od, outer duct of vesicular area; pa, posterolateral angle; par, paramere; ph, phallotheca; pi, pars intermedialis; psl, projection of superior layer of ventral rim; rs, ring sclerites; s, spiracle; tgIX, thickening of gonapophyses IX; v, vesica; vi, thickening of vaginal intima; vr, ventral rim; VII, urosternite VII; X, segment X. Scale bars: 70–74, 76 = 1 mm; 75, 77 = 0.5 mm.

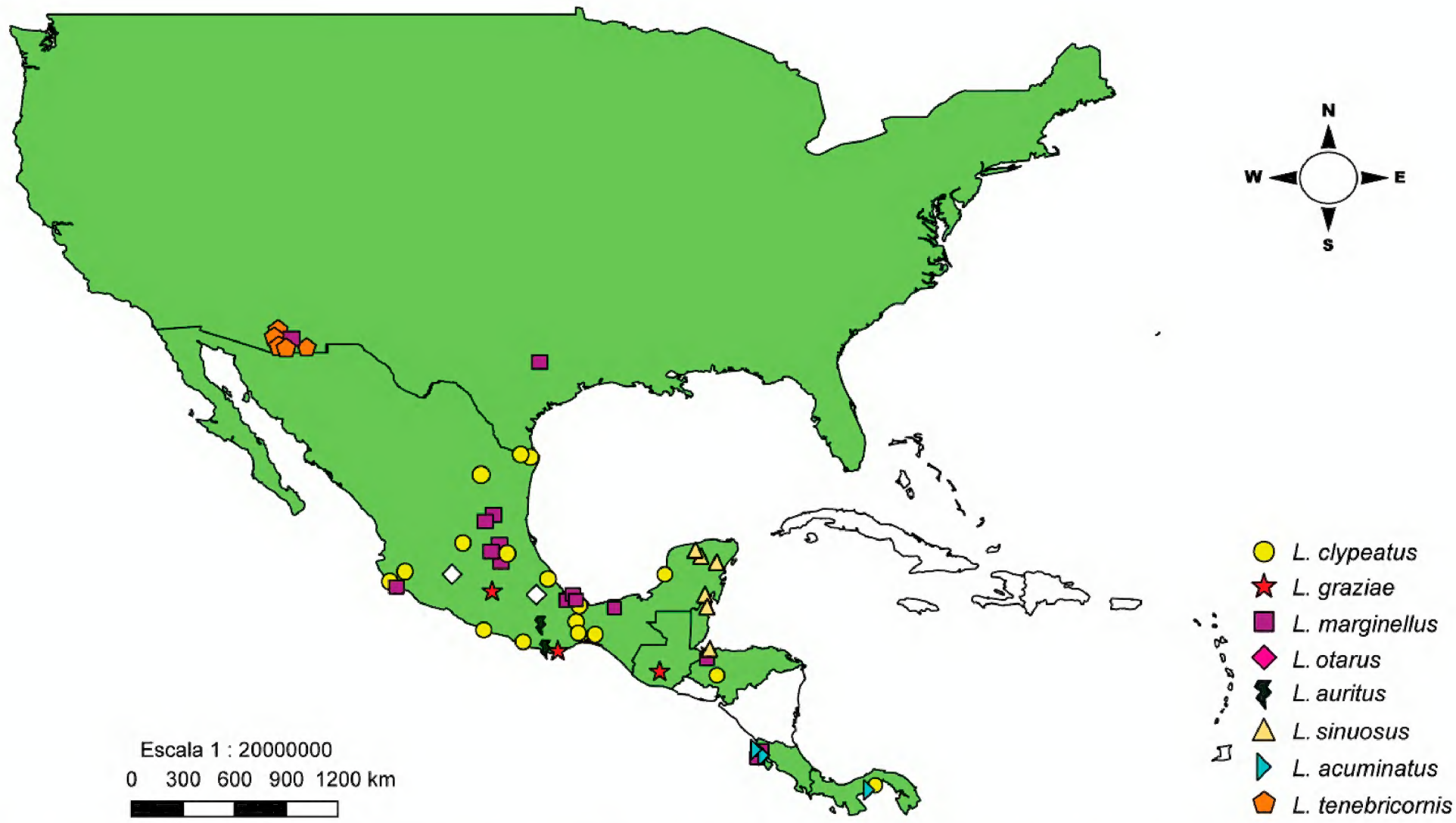

Figure 78. Distributional map for studied specimens of the species of *Lineostethus*. Countries with species records are in green.

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